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ADMINISTRATIVE PROGRESS IN THE ATOMIC AGE?

Lieutenant Colonel Robert B. Rigg, *Armor*
Headquarters, VII Corps

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

IF THE papers in our in-baskets suddenly turned into stone tablets, typewriters were atomized, Mimeograph machines ran out of fluid, and half pound M-1 slates were issued in lieu of paper, the Army could carry on although military occupational specialty adjustments would see clerks and typists shunted into muscular, and even gun-wielding, jobs. This could never happen. But something revolutionary should.

Today, a military campaign through the Swiss Alps by a 25,000-man task force would probably see 700 men directly chained to typewriters, Mimeograph machines, and related appurtenances of administration. Another 600 men would probably be relegated and related to periphery tasks. But these "serfs of a system" need not be damned for they are normal to this *administrative* (and atomic) age.

Marshal Suvarov led such a campaign in 1799, and his force numbered about 25,000. He launched one brutal 2-day battle

with the order, "The opposing army will now be taken prisoners." In this historic campaign, his clerks and administrative personnel might have numbered 290—but probably about 140. He won!

The handwritten messages, carried by runners, and the voice commands sometimes lost in high winds during the age of horseback command have given way to communication over wider fields of action by telephone, teletypewriter, and multiple types of radios. Parallel with the great rise and ratio of these latter means of communication, which commanders before the machine age never had, has been the rise and eye-straining crescendo of massive volumes of paperwork.

Military brevity of correspondence held forth in an age when the human hand had to fashion the missives. It grew sick when the typewriter appeared, and it died when the Mimeograph machine began to rotate. The typewriter and reproduction machine—with their precision and speed—instead of shortening administrative processes have intoxicated the verbose and inspired the silent.

The telephone—conceivably a means to eliminate a degree of written correspondence—has not eliminated correspondence to any noticeable degree. Instead, it has

Brevity of correspondence held forth in an age when hands fashioned military missives. Today, our out-basket dictatorships breed typewriter empires whose products create in-basket slaves on other levels

been backstopped with memo for record forms (which must be often typed) an acknowledgeable necessity that is often abused.

Thus, possessed as we are of a mass of ultra-modern communication means, we slow our efforts, divert our energy, and monopolize time and attention on minutia and detail by our steady manufacture of paperwork. Slowly, like a descending fog, a volume of papers and paperwork have come to cloud our military clarity, efforts, and efficiency. Furthermore, the snow of shuffled papers is slowly leading to casual contempt and the weight of a significant directive is lost or ignored amid the confusion of too much written about too many things. The desk binding effect of our administrative procedures is reaching the point of absurdity.

Signs of the Times

Back when most lieutenant colonels were second lieutenants, a company bulletin board was about 3 by 5 feet. Today, the average company has about double this space posted with memos, directives, and other instructions. The permanent directive portion of this board—sometimes it is one separate board—is awe-inspiring in its amount of fine print and is too often placed in a dull light.

The company kitchens—once administratively governed by a master menu, cook book, and ration list—are now graced with desks and, in some cases, file cabinets, although the more vigorous commanders

manage to eliminate the latter or at least reduce them in size. Administrative requirements vary from place-to-place, but in some areas, 6 months back-files must be kept by the mess steward. The amount of reports and records that company messes are now required to maintain indicates that before too long a clerk typist will be required for the kitchen staff.

The only present asylum from administration and paperwork is the company latrine.

Many companies are, of necessity, adding an extra clerk to their orderly rooms who is not authorized on their table of organization and equipment. For, while the level of clerk efficiency could be improved, it is a well-known fact that companies lose their best clerks to higher echelons. It is on the company level that paperwork is handicapping the Army most. Here at the final receiving end of all directives, the harassed commanders work nights and too many daylight training hours—all at the expense of unit mission and training.

Companies gained a unit administrator—a warrant officer—by virtue of the descending paper load. These administrators were a great help but they have been eliminated. Such personnel cuts are admirable in purpose but they should be proportional on levels above the regiment. It is all too often that staff administrators on higher echelons project the mandatory report requirements that so overburden companies and battalions.

One of the best-selling military textbooks is not concerned with combat, tactics, gunnery, or training. It is on company administration.

Out-Basket Dictatorship

Fifteen years ago a small memo tab could send a basic paper a long way. The tab comment was cryptic and handwritten. Now business is done with an 8 by 10 inch disposition form (DF) of such magnificent

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chlorophyll space that the sender feels he has failed in duty if he has not written at least one full paragraph, and he usually does more.

The "make it look neat and precise" school leads too many officers to have DFs typed. This only requires a typist! Human handwriting, while legible enough for the typist to copy, is not considered adequately legible for the recipient of the DF. And too many DFs fall in the category of

However, at his first meeting with the Army Staff, General Matthew B. Ridgway, the Chief of Staff, remarked, "I think we can do much more by better organization—more of the spoken than the written word, less attention to the written record for alibi purposes, and more efficient and adequate delegation of authority to subordinates."

The extra copy department is grinding in full gear and has developed several

WINE-STEIN THEORY OF ADMINISTRATIVE RELATIVITY

- $$(1) \frac{\text{Size of Staff (No. of typists)} - (2 \text{ coffee calls})}{1} + \frac{\text{Available Paper (5 Carbons)}}{\text{(Paperwork) 4}} \times \frac{\text{No. of Mimeo Machines}}{\text{(Available Ink)}} = \frac{\text{(No. of In-Baskets)}}{\text{(Size of Staff) } \times \text{ (X Hrs.)}}$$
- $$(2) \frac{\text{(In- and Out-Basket Hrs.)} + \text{(Suspense File Hrs.)}}{\text{= Relative Productivity (Action or constructive thought)}}$$
- $$(3) \frac{\text{(No. of Daily In-Basket Papers)} \times \text{(5 Min. reading time)} \times \text{(2 Min. indecision or hesitation)} \times \text{(3 Min. Co-ord. time)}}{1.5} = \text{Minimum Hours At Administration}$$

"comments on the comments" wherein a 5-minute meeting or telephone conversation with other staff members could reconcile the views or solidify the recommendations.

Out-basket dictatorship breeds typewriter empires—batteries of buttocks and clacking machines—whose products create in-basket slaves on other levels.

General George C. Marshall has long held that any problem or subject can be summarized on a single page. He always demanded brevity and clarity of expression. His principle is fortunately preserved in fair degree in some of our higher staff levels, particularly on the Joint Chiefs of Staff and on the General Staff levels at the Pentagon. Business within these staff levels is, of necessity, involved in the study and production of many papers; the need for record and recording is essential because of the weight of the subjects and decisions handled.

subdivisions, the first of which is the "insurance copy division," or the "never let me be caught without a record of what everyone else has said." This "let me have an extra copy" division generates waste time in at least two directions.

The "let me have a memo for my protection" division is composed of the weak and uncertain staff officers who are untrusting of others, and of themselves! They feel superiors and colleagues will not trust their word later unless it is in print, or they seek to divert blame for an action which might later be considered as out of line. This fraternity of alibi spellbinders builds files into astronomical proportions.

The "we must have a copy for our files" division is too often made up of the lazy and ill-conditioned set whose hall-marching or telephone-lifting capability is in inverse ratio to its energy and enterprise at file shuffling.

Also party to this bureaucratic paper-weight-lifting cult are those individuals whose voices in staff session—or before a superior—are weak, but whose suggestions and words find real strength in a text and signature that can be deftly dropped in an out-basket. The roaring recipient may burn holes through the paper and make loud remonstrances to the message center deliverer, but the originator is relieved of the initial torrent.

The consumption of paper and carbons is incidental. The consumption of time is consequential.

Statistics, Surveys—or Action?

The demand for reports upon which to base statistics has reached the level of military unreality.

There are supply and logistical fields where record keeping is essential and vital. Even these break down sometimes and lower echelons must be burdened with survey-making.

The system of requiring accident and incident reports is well intended. These figures combined with AWOL and a few other rates can index—to a degree—discipline, morale, and other factors. But in places the system appears carried too far.

Definitions have been established to place incidents in minor and major categories; the regulations and specifications were explicit that damage exceeding 50 dollars in repairs placed the incident in the higher category. This worked satisfactorily until the summer of 1953, when Ordnance considerably raised its figures for vehicle repair and labor. The statistical-reports staffs were late in catching up with this up-marking, so the result was that incidents of still minor category had to be raised to that of major significance. There were numerous reports in transit that had to be re-examined and resubmitted.

Many finely drawn definitions have so

troubled the troop units that some of them, in disgust, settled minor damages out of individual pockets and simply covered up the accident or incident rather than be bothered with time-consuming paperwork.

In Germany, men returning to the barracks 10 to 20 minutes after curfew became reportable statistics in the same category as a drunken, MP-fighting soldier who was brought back after deliberately staying out 5 hours beyond the prescribed time. There exists thousands of written words, regulating such reporting systems, defining in almost legal terms the types and categories of human errors and accidents to be reported. These directives require reports *in addition* to the well established and normal reports of survey, accident reports, and investigations.

The resultant statistics are used to index the excellence of various units, but the "X" factors have never been integrated into the formula. Thus, an armored unit, training its tankers in aggressive and realistic exercises, may damage a fence, a vehicle in blackout driving may slide into a ditch and be damaged, while another unit training dismounted and perhaps traveling only a fraction of the monthly mileage—and that over better roads—will appear statistically better.

A staff officer initiating a system requiring reports should inquire into the purpose and objective of his measure seriously—will the material be used for action or just a set of file case figures?

Military History—Too Little Paper

One of the most important fields of professional facts and lessons to be learned lies in military history. Only recently has renewed emphasis been placed on the current recording of military history. It is in this field that commands and staffs have been too brief and incomplete in their recording of information.

Here, for the real permanent record, textual volume can be afforded.

Conclusions

Too many officers are writing and reading but not acting or using modern means of verbal communication. Excessive memoranda and missives on piddling subjects and minutiae are obscuring and confusing the more central issues and subjects. Staff members type up too many papers to themselves. The demand for more typewriters and typists is growing, not lessening. Many higher staff officers fail to boil down their written texts sufficiently—younger officers do not know how.

In places there are too many down-the-hall typed memos, and not enough down-the-hall walking and talking.

Military training and other missions are not being served properly because of the excessive demands by some higher authorities for reports.

Some staff elements have developed into statistical bureaus.

Younger officers are growing up in this atmosphere of compounded reports and they are learning bad habits as a consequence.

Unless the trends of excessive paper shuffling and report requiring are curtailed to military—and not statistical—reality, efficiency, and combat excellence,

without a doubt, will suffer in the long run.

Military brevity begins with the elimination of paragraphs and ends with the elimination of pages—and papers.

An Army-wide week should be designated wherein all commands will review their administrative procedures with the object of eliminating excess paperwork. Examination should be made of reports systems, staff co-ordination measures, form simplification, and the general load of paperwork. Critique should follow the examination. Where pertinent, a military-brevity writing course of instruction should be given all staff officers.

Brevity—The Lost Chord

Seven normal paragraphs can require 60 seconds reading time and they will generally consume more than one page. Seven sentences will often suffice.

A fine example of studied brevity was the Joint Chiefs of Staff paper which gave General Elwood Quesada his mission, as well as authority to establish the 9,000-man Joint Task Force III to conduct atom bomb experiments at Eniwetok. The operation, staged from Washington, D. C., Eglin Field, Florida, Los Alamos, New Mexico, and multiple other points, embraced the Atomic Energy Commission and all military services. This Joint Chiefs of Staff charter was one page long, double spaced!

When he was Commander in Chief in Spain in 1810, the Duke of Wellington received a request for another report from a member of the Staff of Lord Bradford, Secretary of State for War. In reply, the Duke of Wellington wrote:

"Spain 1810

My Lord,

If I attempt to answer the mass of futile correspondence that surrounds me, I shall be debarred from all serious business of campaigning. I must remind your Lordship for the last time that so long as I retain an independent position I shall see to it that no officer under my command is debarred, by attending to the futile drivelling of mere quill drivers in your Lordship's Office, from attending to his duty which is, as always, to train private men under his command."

The Tactical Organization of Troops

Guenter Blumentritt, General der Infanterie, *Former German Army*

The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

THIS study is based upon recollections of the author's experience as a teacher of tactics at the Berlin *Kriegsakademie* from 1933 to 1935. At that time, I attempted to interest my students in the historical development of battle formations by supplementing my lectures with lantern slides and with excursions into scholarly military history. I tried to show them how military matters are closely related to political, social, and economic matters. True soldiers, I pointed out, must continually further their general education. Moreover, I wanted to broaden the young General Staff officers' understanding of the scope of military history and genuine military science, for sound and practical knowledge of military science requires an understanding of its historical development.

I do not pretend that the following ideas will stand up, in all respects, under the criticism of professional historians. I was an Army officer, not a historian.

First, however, let us see how far the average German officer pursued the study of history. One-fifth of the officers of the old corps—before 1914—were products of the Officers' Training School, while the remainder came from the *Gymnasiums* (Preparatory Schools) where classical languages and similar subjects had been studied.

One might assume that such a general education would have led to an understanding of historical development in its relationship to the military profession, but such understanding was astonishingly rare. I think that before 1914 not more than 25 percent of all officers showed any interest—of this number perhaps 20 to 25 percent were interested in purely tactical and operational military history. Scarcely 5 percent were interested in military history in its wider sense.

There are several explanations for this. First, the German professional officer had little time for other than routine daily duties since, in the German Army, the officer, not the noncommissioned officer, is the instructor and trainer of men. Second, the German officer was constantly subjected to examinations and inspections, the outcome of which determined his entire future. Because of the methods by which an officer was trained, his entire mentality was directed toward purely practical goals. Little time remained for education in history.

Consequently, our officers, as a rule, began to interest themselves in military history only after they had retired from service and had more leisure.

Moreover, before 1914 and after 1919, the High Command did not encourage officers to write books or contribute to periodicals for public consumption. For an officer such contact with the public was considered inappropriate. There was also fear that such writing would produce "scientists" instead of practical officers. Except during World War I, every German officer was actually afraid to have his name ap-

pear in print. This attitude is still found in our older officers. It does not stem from a feeling of caste, as is sometimes supposed, but from an instilled timidity, of a sort, about contact with the public.

The disadvantage of such thinking is now obvious to the world, since the greatest part of the former officer corps showed recently how difficult it was for them to express their opinions openly. They would rather accept a distasteful or even tragic situation than stand in public opposition to it. This was one of the reasons why Hitler was not confronted with more active opposition.

How few military historians were produced from the officer corps can be seen from the dearth of officer-authors whose military works are widely read. Of the few who dared to write, Clausewitz is our first example.

His name is known in military circles the world over—regardless of whether or not his works are accepted. The contents of his writings are known to a much smaller number and his meaning is comprehended by even fewer.

The works of Clausewitz have long been available in nearly all large technical libraries. Our officer corps might well have been expected to take a special interest in them, but such was not the case. Neither in training courses at the *Kriegsakademie*, nor in lectures did I ever learn anything specific about Clausewitz. This was true of

ten not by officers but by professional scholars. This is true largely because Clausewitz wrote in an "academic" manner. His writings are not easy for the average soldier to digest. His antiquated language is admittedly hard to understand. Time and time again, attempts have been made to publish condensed or modernized editions. Moreover, of the more than 400 pages of his major work, probably little more than 80 pages are applicable today. On the whole, Clausewitz received little acclaim from the bulk of the German Officer Corps. Only his name and a number of partially digested slogans were generally known. He belonged to a distant world, far removed from actuality.

Our officers might well have been expected, also, to derive inspiration from scientific research into the history of military development, but, again there was little interest on the part of the majority. Except for a few retired officers, civilians occupied themselves with this field.

I need only mention the long-deceased Doctor Hans Delbrueck and his assistant and disciple, Doctor Daniels. They showed professional soldiers the impossibility of applying present-day numerical concepts to ancient military history. They—not the professional tacticians—demonstrated how military tactics had developed historically.

Such achievements by civilian scholars should embarrass the professional soldier, who, in most cases, has studied history,

To enable the modern student to understand current military developments and to sense future trends, it is essential that we have a thorough knowledge of history and understand the evolution of formations

about 90 percent of my comrades. We learned little of Clausewitz until 1932-33 and then from a civilian instructor at the University of Berlin.

If you examine the library catalogues under "Clausewitz," you will find that the important books about him have been writ-

Greek, and Latin for fully 9 years before beginning his military career. I shall point out here only what an active professional officer should have gathered about military history in the course of his career, not in order that he might appear "educated," but in order that he might have a firm

basis for the practical application of military theory.

Let us restrict ourselves then to the essential features of the historical development of battle formations.

Ancient Times

A really thorough study of battle formations in ancient times would be interesting to the historian but tiresome to the soldier. The armies of that period were organized in many different ways. It might be mentioned, in passing, that the ancient Persians were much braver than Greek legend indicates, and their numbers much smaller. They developed the art of war to a high point and had a valiant army composed of nobles accompanied, of course, by a host of retainers. Our main interest, however, is with the Greeks and Romans.

The Greeks

The city states of Greece had only small armies. In Athens, the Navy was most important—in Sparta, the Army. The Government of Athens was democratic in spirit, and that of Sparta more authoritarian. However, in both, the armies were composed of citizens whose military rank was determined by politics, economic status, and social standing. Generals were chosen as the necessity arose. Among Athenian troops, discipline was not out-

standing, because the citizens did not adapt themselves easily to the rigors of training and the rigidities of military command. Consequently, an Athenian general faced no easy task. Often he had to beg and persuade before his orders were carried out.

The Greeks employed a combat formation known as the phalanx. While armament and strength varied, its basic formation was as illustrated in Figure 1.

The phalanx consisted of a single, compact tactical body, organized in ranks and files, deep and close together. The younger men were concentrated in the front ranks, the older in the middle, and the oldest in the rear. Their armament included bows, slings, and spears. Light weapons were in front and heavy weapons to the rear. A phalanx advanced because of pressure exerted from rear to front, since the rear ranks, which were less endangered, naturally pressed ahead. Such a formation could only attack straight forward or withdraw straight to the rear. It could not swing to the right, left, or obliquely, and was to that extent a clumsy, helpless body of armed men. In this fashion, the Greeks fought at Marathon. Cavalry played only a minor role.

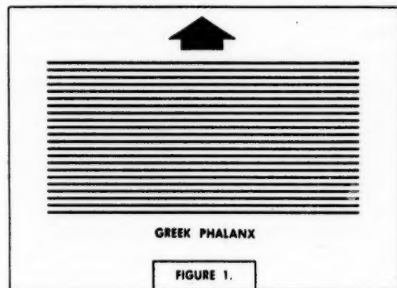
This formation was not satisfactory even for those times. Progress was made in the tactics of Epaminondas, Theban general, who tried to crush the flank of the enemy phalanx by attacking it first at one point and then at another, in what was called oblique battle order.

Since the shield was carried in the left hand, every phalanx involuntarily pressed to the right, making the right wing stronger in depth but weakening the left wing. By attacking the left flank, a new tactic, Epaminondas won the victory.

After a time, when wealthy citizens no longer wanted to serve as soldiers in time of war, further progress was made. Mercenary armies, composed of professional soldiers and led by such generals as Xeno-

Guenther Blumentritt, a former lieutenant general in the German Army, served on the Western and Eastern fronts in World War I. His World War II assignments include: Chief of Operations in Poland and France; Chief of Staff to the Commander in Chief, German Army West; Commander of the XII SS Corps; Commander in Chief, Twenty-fifth Army, Holland; the First Parachute Army; and the "Armee Blumentritt." He is the author of "Operations in Darkness and Fog," and "Strategic Withdrawals," which appeared in the July and September 1953 issues of the MILITARY REVIEW, and is assigned to the Historical Division, Headquarters United States Army, Europe.

phon, were created. Paid troops could be drilled and subjected to rigid discipline. Military science rose in importance and improvements in combat formations began to be made. The phalanx was divided into separate elements, each of which could be



employed tactically. Training methods for various arms also underwent changes.

The Romans

Ancient Rome's hard, militant political structure was one of its distinguishing characteristics. The Roman spirit was not carefree like the Greeks'.

The early Roman phalanx, nevertheless, was similar to the Greeks'. A later improvement consisted of a formation in three sections, one behind the other and therefore "in depth"—called the *principes*, the *hasati*, and the *triarii*. The phrase *Res ad triarios venit* does not mean that "the decision rested with the *triarii*" for they were not the best or elite warriors, but were, in fact, the oldest. The expression means that the battle's outcome had become so doubtful that even the reserves had to be employed.

The legion, famous in Roman history, was the next development. Its strength varied from 4,500 to 6,000 or more men. Like the early formation, it was three sections deep. Moreover, the three sections were still narrowly circumscribed in their movements. Not much maneuver could be accomplished with them. For example, side-wise movements of the second and third

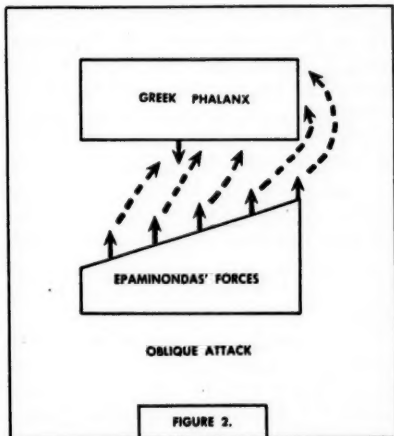
sections were very difficult. In short, the tactical organization of the legion was fixed initially by the employment of the phalanx.

At Cannae the full weakness of the phalanx was disclosed.

The course of that battle is well known. Our interest is in the new formation employed by the Carthaginian Army. It had two rearward wings supported by cavalry. In the course of battle these two wings could encircle the Romans from both the left and the right. A new tactical idea was thereby contributed to the art of war.

After Cannae the Romans introduced many improvements, but no radical changes appeared until the terrible defeats suffered by the Romans at the hands of the Germanic invaders led to significant improvements in battle order.

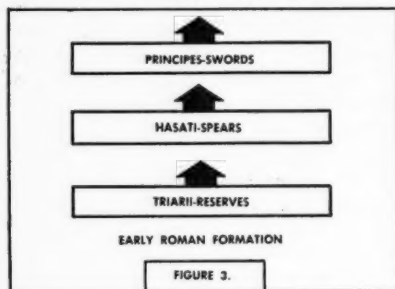
Marius, a sturdy and simple "son of



the people," was responsible for the reorganization of the legion. The three-line phalanx was broken up into numerous homogeneous subdivisions called maniples and centuries. There were two centuries in each maniple, as shown in Figure 5.

A formation that could respond to tactical situations had now been devised. Individual maniples could be dispatched

against the enemy flanks or turned to fend off a flanking attack. With such a flexible force a commander could "maneuver." Such maneuvering required strict training and discipline. But by this time the noble Roman citizens, like their Greek counterparts, no longer wanted to serve in the army. Service in the legions was, therefore, left largely to paid professional



soldiers, who could endure the training and discipline required. Such men made up the Roman legions that built the Empire.

Two weaknesses marked the Roman military structure. First, its staff officers were not efficient. These "tribunes" had not won their positions by ability. They had seen very little military service, and they had little understanding of military subjects. The centurion, or noncommissioned officer, was the backbone of the Roman legion.

Second, the Roman cavalry was of almost no consequence. Only the sons of the upper classes were its officers, and they entered for pleasure rather than from a desire to pursue a serious military career. Consequently, light Numidian and heavy Teutonic cavalry were hired.

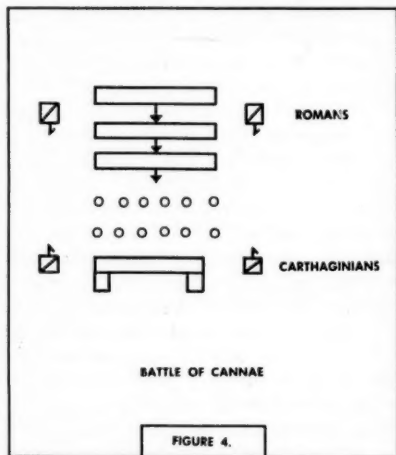
The Roman Army was at its best in tactics and organization during the time of Julius Caesar and early emperors. Its tactical employment of cohorts was a remarkable achievement for those times. An order of rank had been developed in which the oldest centurion in a legion commanded

the right side of the century farthest to the rear. In this manner men were promoted through the legion. In my opinion, the order of battle in a Roman legion at the time of Emperor Augustus was more advanced than that of many of the armies of the Middle Ages and early modern times.

With the decline of Rome as a state, Roman military art also declined. There are many grounds for believing that without the collapse of Roman militarism, the German hordes could never have destroyed Roman civilization. The Roman legions long withstood the attacks of the "wild" barbarians from the north, but they no longer had the spirit and will of the old Roman people.

The Middle Ages

In many respects a retrogression in the art of war took place in the Middle Ages.

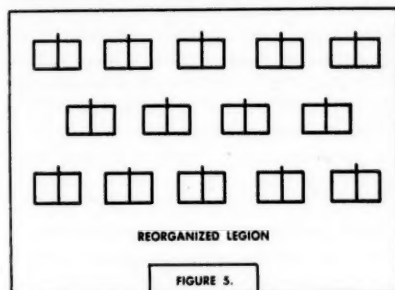


The scale of warfare diminished and its methods became more primitive.

In the age of chivalry, surprisingly enough, much effort and a long time were required for a great king like Charlemagne—who ruled over both Franks and Teutons—to assemble a few thousand

knights who were willing to go to war. Each individual knight was a hero jealous of his reputation. Discipline, however, was almost unknown. No knight underwent rigid training as we know it. No knight gave "orders" to an equal in station.

Knights fighting on horseback did not constitute cavalry as the term was later understood. In poems and paintings the knight is pictured charging his enemy at



full gallop. Nothing could have been farther from the truth. Covered by heavy armor and bearing a knight armored from head to toe, the war horses of the day could barely trot at best. So, advancing in open formation, echeloned two and three lines deep, the knights urged their horses into a clumsy trot just before reaching the enemy who, of course, approached in the same manner.

The leader was followed only during the attack. With the initial clash all semblance of order vanished and, in the ensuing battle, each warrior searched out a single opponent. Once unhorsed, an armor-burdened knight on the ground was scarcely able to move.

No wonder these medieval knights were defeated in the east by the mobile armies of the Mongols, Huns, and Slavs. In the fourteenth century, at Sempach and Morgarten, an army of armored knights was defeated by simple Swiss peasants, who, fighting on foot, knocked the riders from their horses merely by swinging long scythes and lances. The tactics of the

Swiss peasants were superior to those of the trained knights.

Widespread knowledge of such tactics, together with the invention of firearms, brought an end to medieval combat methods.

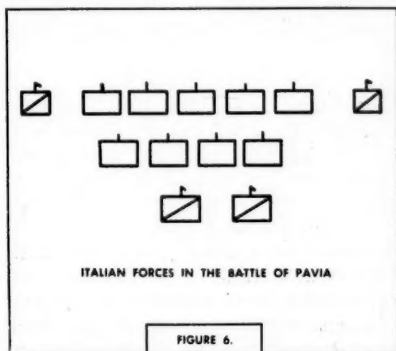
Early Modern Times

The art of war received new impetus at the beginning of the sixteenth century. The Italian Renaissance and the rise of Spain as a world power led to the creation of mercenary armies again. The rise of professional armies has always resulted in the refinement of military tactics. The training and discipline essential to improved fighting methods can be attained only when the composition of an army does not change continually.

Italy

In Italy, commanders like Pescara led mercenary armies of foot soldiers. The forces fighting the Battle of Pavia must have been organized as shown in Figure 6.

Here we find nearly the same formation as that used by the legions of imperial



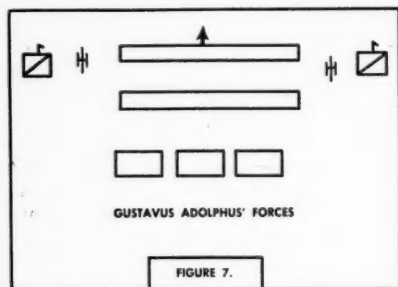
Rome. However, primitive firearms were now being used. The horsemen were no longer knights, but mounted soldiers.

However, the cavalry still charged at a trot, and fighting between individuals still broke out after the initial clash.

The infantry, marching to the beat of

drums, moved up in close formation. Artillery pieces were fired through gaps in the line of infantry or from positions on a nearby hill. The general himself actively fought in the battle. Armies were expensive to organize and hard to replace.

A period of limited actual fighting but



more maneuvering began now. Strategy was coming into its own.

Under Charles V and Philip II, the much-feared Spanish infantry was created. Battle formations still closely resembled those of the Roman legions. Troops were armed with swords, spears, cross-bows, and primitive firearms. The battle order allowed for increased tactical employment.

The Thirty Years' War

The Thirty Years' War began in 1618. Under the House of Orange, Dutch military development advanced and a war academy was founded. Dutch battle formations resembled those of the Spaniards'.

Gustavus Adolphus brought from Sweden a small, but excellent, army. His cavalry was well disciplined. Although it used no new methods of attack, it did attack, firing pistols from horseback and thus gained greater importance. The infantry was accompanied by light artillery.

Battle formations remained closed but were extended in length (see Figure 7).

Firearms gradually improved in design and were used more generally. The formation shown in Figure 7 was extended so that more rifles could fire side by side.

The slow matchlock was replaced by the flintlock. War became a succession of marches and maneuvers. Battles were avoided wherever possible.

With the end of the Thirty Years' War in 1648, widespread political and military changes came about which can now be viewed as turning points in history.

Regular Armies

With the rise of absolutism and national states, monarchs wanted permanent armies—armies that would always be at hand. Until this time, a ruler threatened with war had to hire an army from great mercenary commanders like Wallenstein. But armies hired for money raised problems of loyalty, and the ruler was not always the sole master of his men.

Absolute monarchs now set about to establish private armies whose officers they could appoint and whose loyalty was beyond question. It was no simple matter for them to develop an officer corps. Nobles were reluctant to exchange the free life of their castles and estates for the rigors of a military career. Slowly, however, the great princes forced their nobles to become professional officers in the modern sense. The constant internal struggles of the last half of the seventeenth century helped them to bring about this development.

Noncommissioned officers and privates were easier to obtain. They could be bought, hired, or simply impressed into service.

With these changes in the composition of armies, new battle formations were developed.

France

With the aid of Turenne, Vauban, Colbert, and his ministers, Louis XIV established a centralized state, humbled the aristocracy, and began his climb to world power. Under him the French Army soon became the model for western Europe.

Today, three-quarters of all military terms and concepts are derived from the French.

Under Louis XIV armament and organization were improved and a professional officer corps was established. Military science was refined; regulations were issued; and clothing became uniform. Butressed by its new military power, France ventured to compete with England.

Prussia

Tiny Prussia, in the late seventeenth century, could not compare in power with France. Her Army was small and ill-equipped. Politically dependent on the Austrian Empire, her position was unimportant.

The Prussian Army remained undistinguished until the turn of the century, when Frederick William I—the “soldier-king”—modeled a fighting force after that of the French. At this same time, Prussia declared her military officer corps to be the highest profession in the state.

Eighteenth Century Armies

Battle formations employed by European armies in the eighteenth century closely resembled each other. Armies were expensive, however, and open battles were still avoided wherever possible. Since a single battle often involved a country's entire army, losses in battle were not easily redeemed. The art of strategy—practiced with greatest skill by Prince Eugene of Savoy—consisted of long, rapid marches and deceptive maneuvers of all kinds.

Armament was still simple. The smooth-bore muzzle loader could be fired a distance of 150 yards at most. Loading was slow and aiming crude. Artillery had still to prove its worth. It was not to become important until the Seven Years' War. The infantry and cavalry were the decisive elements in battle.

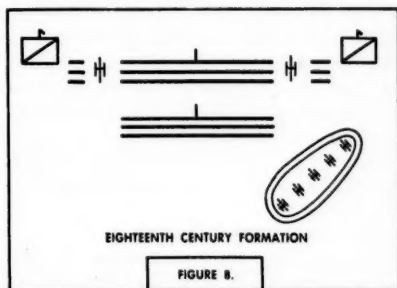
Men were still frequently pressed into service and, as a result, desertion was common. Love of country was still unde-

veloped. Even in the camps, cavalry had to guard troops who tried to run away.

A battle formation of the eighteenth century followed the general pattern shown in Figure 8.

Again the troops were organized in one or two echelons, one behind the other. Each echelon, consisting of an extended line three ranks deep, was commanded by its own general. The first row fired from the kneeling position and the second and third rows, standing. Riflemen fired in volleys by battalions. To attack, the long line moved slowly forward. Platoons advanced in succession: one group firing, then reloading while another group moved up to fire.

The first volley was fired at a distance of 150 yards from the enemy. Once the armies had clashed, close-up and hand-to-hand fighting broke out. Each battalion had a few artillery pieces, and these fired grape shot from the spaces between echelons. The main body of artillery was placed either behind or to the side of the



complete battle order. The heavy cavalry served as an attack force and frequently was the deciding element in the battle. The light cavalry—Hussars—was employed as a reconnaissance or cover force, and often made isolated raids. Most of the Hussars were volunteers and good warriors, but in Prussia, at that time, they were not greatly respected.

Open terrain was preferred to woods and forests, since the war machinery of

the period was not easily maneuvered. Construction sacrificed strength for ornamentation.

The battle formations of this period were significant not so much for their effectiveness as for the influence they had on subsequent development. Troop discipline increased in importance as only strict, constant drill could train men to hold the artful formations together under fire.

The Prussian Army maintained the best discipline. The Prussian infantry entered the battle marching in step. Every move was made precisely according to order. Loading and firing, each motion of which required a separate command, were executed at the rate of six shots. Such speed required constant drill and rigid discipline. The close-order drill of that period was not parade drill but actual training for battle.

Cavalry tactics had by now changed considerably. The cavalry now charged in ranks, stirrup to stirrup; first at a trot, then at full gallop. The impact of the first clash was usually decisive, contrasting with the prolonged, hand-to-hand fighting that had characterized earlier battles.

Prussian battle formations became the standard for this period. The Prussian Army differed from its contemporaries only in the extent of its achievements.

Political Change

Just as the "modern" forces of the Roman legions were finally defeated by barbarian hordes, so the highly-developed armies of the eighteenth century were to meet and be defeated by a primitive enemy in the wooded regions of North America.

In fighting for predominance in the new land, both England and France employed European-trained "regulars." At the same time, both nations enlisted support from Indian tribes, whose methods of fighting contrasted sharply with the rigid formations of Old World armies.

A third element appeared, however, in the form of the white colonists, who combined the techniques of the civilized and the primitive armies. The colonists were a colorful mixture—close to nature, bold, adventurous, and versatile. They looked upon European armies as symbols of servitude and instruments of unethical absolutism. No frontiersman would subject himself to the tiresome training necessary for precise formations and "showy" maneuvers. His attitude was not unlike that of the medieval knight.

Accordingly, the battle formations of the Continental Army were influenced by the American's distaste for regimentation. Of far greater significance, however, was the influence of nature, the need for conforming combat techniques to the demands of the forests. The European armies transplanted to the New World were no match for the more primitive and flexible irregulars.

While there were individual European officers among the forces of the colonists, the influence of such men as Steuben and Lafayette was not as widespread as the monuments built in their memory would indicate. However, the aged King of Prussia, Frederick the Great, interested himself during his last years in the new battle formations developed in the New World.

The great Prussian King also read reports of the fighting in North America. As a result of his study, he introduced "light infantry" and a loose order of battle into the Prussian Army. This innovation, however, was not used widely.

France

Closely following the American War of Independence came the French Revolution. In France, as in America, the revolutionists looked with suspicion on the army organized by the monarchy. The new French revolutionary army knew little of regimented drills, its officers were "elect-

ed" commanders. Battle formations were loosely organized in extended order.

In the seemingly endless succession of campaigns that followed 1790, the young republic had to stand up against the old monarchies of Europe and the proved battle formations of the previous century. The result argued strongly for more flexi-

and such matters not immediately concerned with actual fighting. Under him the Army of the Revolution became an imperial instrument. Through his influence it improved its artillery but did little to improve its rifles. Training received less emphasis than the actual conduct of operations.

Napoleon's cavalry was organized in solid formation, although cavalry was also used for reconnaissance. Because of the lack of emphasis on training, the cavalry achieved little success as a long-range reconnaissance force.

The battlefields of Europe between 1796 and 1815 were a scene of struggle between the old and new orders. In the Battle of Jena—fought 14 October 1806—Prussia was roundly defeated by the spirited forces that stemmed from the Revolution.

The campaign of 1806 was won by superior strategy. Napoleon moved rapidly and continually, while the dogmatic, suspicious Prussian generals employed waiting tactics. The French general planned his encirclements while still far from the enemy. His skirmishers moved forward gradually—running, kneeling, and crawling until they reached the inflexible, closed

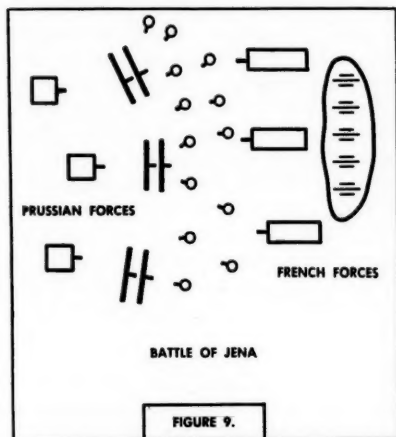


FIGURE 9.

bility of command. Bolstered by faith, the new French Army, spreading the spirit of the Revolution over nearly all of Europe, scored surprising victories.

Citizen Armies

With the advent of "citizen armies," like that of the French revolutionaries, short periods of training and greater personal liberty within the military framework helped to produce a new loose battle formation.

Advancing as skirmishers, the flexible French citizen-soldiers took cover in the terrain and kneeled or flattened themselves on the ground when shooting. Behind them came closed columns of reserves. But armament was little improved, and rifles and artillery pieces retained their essential features.

Napoleon was a battle tactician who had little interest in training, regulations,

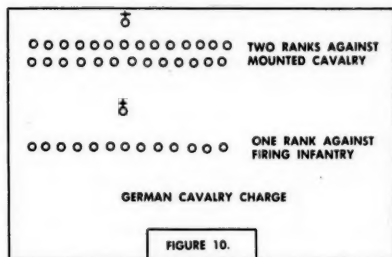


FIGURE 10.

lines of the enemy. The standing Prussians made perfect targets, while the crouching or prone French were difficult to hit with the inaccurate rifles of the day. As soon as the enemy began to falter from the fire of the skirmishing riflemen, strong columns of troops from the rear marched up to

pierce the enemy lines. Napoleon's excellent artillery completed the victory.

Jena produced a sobering effect on Prussian military organization. Colonel York von Wartenberg soon reintroduced the open order of battle. The new tactical concepts received strong support from Scharnhorst and Gneisenau. Other European armies followed Prussia in copying the French example, so that the new battle formations of the allied armies in 1814-15 enabled them to meet Napoleon on his own terms.

It is worth noting that very strong French forces were necessary in combating the guerrilla-like tactics of the Spaniards and the Tyrolians during the course of the Napoleonic Wars.

The Nineteenth Century

With the conclusion of the Napoleonic era, Europe entered a period of relative peace. The old monarchies of Prussia, Austria, and Russia tried their best to uproot the ideas of the French Revolution that had spread throughout the Continent. In fact, Metternich and other reactionary statesmen were seemingly successful in stemming the growth of liberalism. As was not unlikely after a prolonged period of war, military development stagnated. Little change took place in the organization of battle formations during the few decades following 1815. Some states introduced compulsory universal military service, which was a significant development in a time of peace, but with no sizable wars to fight, military service degenerated into a routine of guard duty and parade-ground drill.

From about 1850, the effects of the Industrial Revolution began to make themselves felt on military developments.

The flintlock became obsolete. The rifled barrel replaced the smooth bore and increased the rifle's range and accuracy. Entirely new gun models soon followed. Hardly a year went by without the inven-

tion of some new arm. As a result, tactics lagged behind technical improvements in armament.

The period of political reaction after 1815 also saw a return to the closed lines and rigid formations of prerevolutionary armies. Even in royalist France, the Army reverted to the older formations.

The Mauser rifle, a breech-loading weapon with a rifled barrel, appeared at the middle of the century when combat formations were still adapted to the weapons of the previous century. The breech-loader permitted easier, more rapid loading and firing from a prone position. The rifled barrel and better cartridges improved accuracy.

To what extent did this new weapon change the Prussian order of battle? Very little, even as late as the Franco-Prussian War of 1870-71. This is shown by the heavy losses suffered by the Prussian guardsmen in the fighting at St. Privat on 18 August 1870. Within a few hours the Prussian regiments had lost nearly all their officers. The French had introduced the new Chassepot rifle, with a maximum range of 1,300 yards, and were well dug in high on the hills of St. Privat. The Prussian Guards, although they could not shoot accurately at a distance of more than 450 yards, advanced in company column. The First Guard Division wheeled in closed formation around the village of St. Marie aux Chones, while the troops were under French artillery fire. With music, drums, and banners flying, and propelled by iron discipline, they proceeded in a virtual march of death. They won the victory, but with tremendous losses!

After 1871, all states gradually acknowledged that such tactics were no longer feasible. Actual change, however, did not take place rapidly. Much was written concerning the "new tactics" but little was actually put into practice.

Magazine-fed rifles with a range up to 2,600 yards were introduced after 1871.

Smokeless powder was invented and the lock mechanism improved. The end of the century brought recoil mechanisms and rapid-firing weapons. Despite these improvements, however, the battles of the Russo-Turkish War of 1878, the Serbo-Bulgarian War of 1885, and the Turko-Greek War of 1897 still employed the closed formations of the period of flintlock muskets.

The Boer War of 1899-1901 again demonstrated the value of flexible deployment. The Boers, like the American colonists, were free men, hunters and farmers, who were not willing to serve in regular armies. But despite their lack of discipline, the Boers' mobile fighting methods proved far superior to the rigid, European tactics of the enemy.

The Boers fought in thin skirmish lines which took full advantage of the terrain. Their horses were kept under protection in the rear, ready for use in shifting the attack to the flanks. Riding to a new front, the Boers would dismount, run into position, and fire, but never attack. Their strength was not in attack but in mobile defense. The red-coated British troops, from their dense formations, fought with great bravery. However, they made easy targets for the Boer farmers firing from cover at 875 yards.

Even more antiquated were the cavalry formations of the period. Until 1900, the cavalry was unwilling to dismount, and looked with disdain on the new "mounted infantry." Lances and sabres were still its chief weapons. It had little chance for success against well-armed lines of infantry, and even less chance against dispersed infantry. The feeling persisted, despite the practical considerations to the contrary, that kneeling or lying flat in combat was an act of cowardice. Until 1914, even shields on artillery pieces were regarded with disdain by the traditionalists.

The Twentieth Century

The period between the Boer War and 1914 saw rapid progress among all armies. The Russo-Japanese War and the fighting in the Balkans proved the value of the machine gun. Military regulations were modernized. Closed formations were finally abandoned in favor of the skirmish. Only the cavalry lagged behind, still thinking in 1914 that it could attack.

When battle formations were made to conform to armament, training shifted from the drill ground to natural terrain, although drills and training exercises still included a larger number of the old, rigid formations than was justified by the necessity for discipline. Looser battle formations would have greatly reduced the heavy losses sustained by both sides during the early part of the war.

World War I

Nearly all European armies employed the same general type of battle formation. Germany, however, faced the war, after 43 years of peace, with almost no modern military experience. Its experience in the fighting in Southwest Africa had unfortunately not been applied to the Army at home. Russia, on the other hand, had fought two wars, in 1878 and 1903-05, and both the English and French had gained experience from their respective colonial wars.

In 1914, the German peacetime company consisted of about 120 men. In wartime, the number rose to 250. Each peacetime company was organized into three platoons of four squads each, with eight men in each squad.

It was not easy for a platoon leader suddenly to be assigned twice the number of personnel normally allocated. Moreover, a company of 250 men was too large for practical employment. Such apportionment led to mass commitments and resultant high losses.

In 1914, the German Army used an 1898 model rifle. Each regiment was assigned one machine gun company of six guns. No other machine guns were assigned.

Beyond the range of enemy fire, companies were marched in column. Within the range of enemy long-range fire, companies advanced in three separate platoon columns. Each platoon leader could advance his platoon in such a manner as to take advantage of the terrain.

When under enemy fire, or when opening fire on the enemy, the platoons shifted into open order, usually with two platoons on line and one in reserve.

Men were 2 paces apart, with the squad leader 10 paces in front of his men. The platoon leader stood 20 paces in front of his platoon and issued loud commands as though on the drill field. To open fire, the squad leaders advanced to a line abreast of the platoon leader and the squads moved up on line with their leaders. The entire platoon then stood in a single line facing the enemy.

Since the wartime strength of a single platoon was from 60 to 70 men, the platoon leader could not easily give orders to his entire unit orally—especially over the noise of firing.

Each platoon was a separate firing unit. Over open terrain it advanced rapidly with short ordered halts for firing or for taking cover.

This organization was still not fully adapted to defense against rapid-fire weapons because the distance between men was still too small; the platoon was too large and the skirmish line consequently too long; terrain was not sufficiently exploited as cover by the individual soldier; and a straight line of men presented a perfect target for machine-gun fire.

The Russians advanced in a similar manner, although in an even tighter formation.

Despite the experience of the Russo-

Japanese War, the Russians still employed antiquated formations, with little regard for casualties. When the front line was lost, the second and third lines advanced over the bodies of the fallen. This was the manner in which the Russians attacked in 1914-18.

The French more often advanced as skirmishers.

Each soldier in this way could make the best use of terrain, but there was less control during the fighting.

The Austrian Army also adopted fairly loose skirmish lines. Despite their experience in the Boer War, the British still employed tight formations similar to the Prussian.

In all cases the error was the same. Battle formations were still not fully adapted to new developments in armament.

Cavalry Formations in 1914

In both the German and Austro-Hungarian cavalries the idea of "attack" was still foremost, and attacks were still launched by large units, even though they were repeatedly beaten back with heavy losses.

The French and British cavalries, while not fully modernized, were trained to fight on foot. The Russians, who were even more advanced, nearly always dismounted when under fire. Regardless of the cavalry formation employed, however, cavalry attacks of any kind amounted practically to mass suicide.

The German cavalry company charged as shown in Figure 10.

Field Artillery in 1914

With the start of the war, the German light artillery was organized into batteries of six guns each, the French into batteries of four guns, and the Russians into batteries of eight guns. The German heavy artillery was organized into four-gun batteries. This number proved to be the best.

In Prussia, the artillery was an auxiliary weapon, below the infantry and cavalry in esteem, even though the heavy artillery was more modern and received greater attention under Kaiser Wilhelm II. In Bavaria, Saxony, and Württemberg, on the other hand, the artillery was a privileged arm. In those states princes frequently served with the artillery, while in Prussia they preferred service with the infantry. In Prussia, then, the artillery was a stepchild. Horsemanship and the thrill of galloping behind the infantry were regarded as more interesting than firing guns.

The French and Austro-Hungarian artillery traditionally enjoyed the greatest respect among European armies. At the start of the war these artilleries were more modern than the German. The Russian artillery was known for its cleverly concealed positions.

I have directed close attention to formations employed in 1914 because that year marked the end of a period in which battle formations had little relation to armament.

The year 1915 brought few actual changes in regulations. The troops, however, began to develop their own methods independently. Skirmish lines were extended and dispersed and combat movements of the type learned on the drill ground were moderated. Artillery guns were now fired from concealed positions. The cavalry learned that it could no longer attack and the lance lost its importance as a major combat weapon.

In 1916, the war of movement changed into a war of stationary positions. Artillery increased in importance and was more widely employed. Drum fire was developed. The infantry began using light machine guns and mortars. "Cavalry" existed only in the east; in western Europe the old cavalry units had been reorganized into light infantry. With the realization that

battle formations must be related to armament, battle tactics underwent further essential changes.

During the last 2 years of the war, regulations and standing operating procedures were subjected to thoroughgoing changes.

The infantry platoon was reduced in size and divided into squads and it moved by squads. The squads were given individual combat missions. Leadership of a platoon became more difficult as the organization grew more complex. Light machine guns and mortars now supplemented rifles in the armament of squads and platoons. With the squad as the smallest tactical unit, co-ordination and co-operation were more important than ever.

In platoon formations each squad leader was now free to order the movement of his squad in accordance with the tactical situation.

The platoon leader could now issue orders to the individual squad leaders, so that the platoon could assume a variety of formations in the course of an action.

During the period 1916-18, the cavalry was either reorganized into infantry or—as in the east—into mounted infantry.

The artillery now achieved new importance, next only to the infantry. Technical improvements, resulting from the application of mathematics and physics, greatly improved gunnery.

The tank first appeared in the British and French Armies of 1916-17. The German High Command had already rejected a tank invented by the Austrian engineer, Dr. Heigl, just as Napoleon rejected Fulton's steamboat. The slow, clumsy tanks, which bogged down easily, were initially a shock to the German infantry, but both infantry and artillery soon learned how to defend themselves against them. Germany also began building tanks, although very few were employed, and these few had no significant effect on battle formations.

Between Wars

Peace allowed time for reflection upon wartime experiences. Military writers occupied themselves with the new problems. Military regulations grew in volume.

This was the period of the German *Reichswehr*—the 100,000-man Army. The refinements and complexities that resulted from German military advancements at this time, while feasible in a stable regular army, did not always consider the requirements of simplicity in war. The strong French Army and the newly-created Soviet Army occupied themselves with practical problems, as disclosed by their military literature.

The German *Reichswehr*—its size reduced to impotence—concerned itself more with theory.

Until 1930, the battle formations employed by the *Reichswehr* were merely refinements of those used before 1918. In 1930, the rifle squads and machine-gun squads were reorganized into groups including both rifles and machine guns. Platoon leadership, however, was unchanged. The heavy infantry weapons assigned to the regiment were the same as those authorized under the Versailles Treaty. Under that treaty, also, the *Reichswehr* was permitted 3 cavalry divisions, totaling 18 regiments. The cavalry was completely reorganized and the lance finally abolished.

The artillery retained the importance it had won during the war. This was clearly indicated by the composition of the high command at that time. Von Fritsch, Beck, Halder, Von Kluge, Von Brauchitsch, all were artilleryists. Significant advances were made in firing technique and the tactical employment of artillery.

World War II

In contrast to 1914, all armies, including Germany's, entered World War II with battle formations and tactics which no longer lagged behind armament. This pe-

riod need be given only passing mention, however, since no great changes in battle formations developed. It is true that there was now much closer co-operation between infantry and armor, for which new tactics were required. The actual battle formations, however, were not changed in any essential respects.

The Future

Now, with the development of new, more powerful weapons, we are again at the threshold of a new era. The open combat formation has presumably reached the peak of its development. A more widely dispersed formation would be difficult to imagine. Still, I believe that warfare will continue to develop new battle formations so long as technology continues to produce new weapons.

For a long period the infantry was considered the major arm. During the later part of World War I, its star began to wane. However, the infantry can no longer hold its own against machine weapons, armor, and aircraft. It will become an auxiliary service. The cavalry will never again be used as it was organized formerly. The artillery, which came into its own during World War I, will also lose its importance.

Warfare is now dominated by air power and armor. On the ground, weapons will be motorized. Battle formations will be developed not for the infantry, cavalry, or artillery, but for tank forces. Those arms which enjoyed pre-eminence in former days will now serve only as auxiliary weapons. The infantry will be reduced in numbers and will be equipped even more extensively with automatic weapons.

Battle formations will, therefore, be formations of tanks, mounted infantry, and motorized artillery.

Conclusions

It has been the purpose of this treatise to show how rich and inexhaustible the field of military history can be. An of-

ficer should possess an understanding of military history if he is to understand his profession in its fullest sense. Because such an understanding does not exist, already, it should be provided through training in the military schools.

The military field is closely linked on every side with history, politics, economics, philosophy, physics, and the other social and natural sciences. While an officer cannot be an expert in all these fields, he should have sufficient general knowledge to understand the broad relationships between them. He need not be a Leonardo

da Vinci—indeed, the store of knowledge is now so vast that all fields of knowledge are no longer possible—but he should be able to see his profession in its social perspective and realize that a military career has more to offer than is recognized by the general public.

This article also indicates that the practical-minded soldier, as well as the professional historian, can benefit from the study of military history. To understand current military developments and sense future developments, a thorough knowledge of history is essential.

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The Kumsong Salient Battle

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

OF ALL the hazardous military operations, a daylight withdrawal under enemy pressure is probably the most fraught with danger. Should control be lost, a disaster can ensue. Such a situation faced the II Republic of Korea (ROK) Corps in the Battle of the Kumsong Salient in July 1953.

The II Corps defended the east-central sector in Korea and guarded the principal approach to the hub town of Hwachon. The hydroelectric station at Hwachon furnishes the major part of the electric power for South Korea. The loss of Hwachon could have hampered the shaky South Korean economy. A little further south of Hwachon is an important army maintenance area.

The front of the II Corps at the beginning of the action formed a rough arc bulging into Communist lines. The Kumsong River was the base of the arc. The terrain held by the Corps was typically Korean—steep mountains and limited road net. Almost all movement in the Corps sector, other than on the two principal north-south main supply routes, is cross-country—slow and fatiguing.

During the month of June, strong enemy attacks had pushed back the Corps' main line of resistance. However, the new line still bulged prominently into enemy territory. During the first 3 days of July, the enemy mounted heavy attacks against outposts on the east flank of the Corps.

This fighting came to an inconclusive end with neither side able to secure the outpost area.

On 13 July, the II Corps was disposed with four divisions abreast, from west to east, the 6th, 8th, 3d, and 5th Republic of Korea Divisions (see Figure 1).

The ROK 11th Division was in Army reserve in the Corps sector. All divisions were at effective strength both in personnel and equipment. While the divisions lacked organic artillery, they were supported by equivalent artillery organized into groups subordinate to an American artillery group. This American group headquarters functioned as the Corps Artillery Headquarters. The Corps had a normal complement of corps general support artillery battalions. The American group headquarters did not have the complete communications normally available to corps artillery headquarters. Particularly lacking was the SCR-399 radio net.

Enemy Attack

Early in the evening of 13 July, the enemy launched the heaviest attack seen in Korea since 1951. This attack began with heavy probes at 2045 in every division sector. These probes were followed by attacks of successively larger units. Elements of five enemy divisions were later identified as making these attacks. By daylight of the 14th, the attacks had all been contained except for relatively minor penetrations in the areas of the 3d and 8th Divisions. However, on the Corps west (left) flank a deep penetration had been made through the Capital ROK Division of the adjacent United States IX Corps. Through this gap enemy of unknown strength had started to attack re-

serve elements of the 6th Division whose main line of resistance was still intact (see Figure 2).

In view of the threat to the entire II Corps sector—because of the serious breakthrough on the Corps left—the Army Commander at 1200 on 14 July, ordered an immediate withdrawal by the II Corps to the high ground generally south of the Kumsong River and extending westward to the junction of the Kumsong River and the Pukhan River. This move would deny the enemy the now open west flank of the friendly bulge. It would also put the II Corps on defensible ground, firmly tied in with the units on the left flank that had been brought up in back of the Capitol Division.

However, unknown to the Army and Corps Commanders, the II Corps, by noon of the 14th, had already started to withdraw under pressure of the enemy. By the time the order to withdraw to the new line had reached the divisions, the bulk of the troops of the 3d, 6th, and 8th Divisions had fallen back to a prepared defensive position considerably south of the Kumsong River line.

In the withdrawal order, Corps Headquarters has stipulated that no artillery battalions would displace to the rear without prior Corps approval. In many instances, particularly on the 15th, the artillery found the infantry to its rear by the time permission to displace was

cutting into the main supply route from small side roads kept the flow of traffic to a snail's pace. There was little or no traffic control by military police. On one relatively short stretch of road, 62 artillery pieces were counted at one time. At times, several artillery battalions were forced to displace without Corps approval or they would have been overrun. In this near-precipitous flight, much valuable equipment was abandoned or lost—particularly vehicular mounted radio equipment. An observer in a helicopter flying north on the afternoon of the 14th reported seeing the roads jammed. To the north of the last traffic jam there was only a void marked by abandoned equipment. There were no visible signs of the enemy moving south from the Kumsong River area. Later, on 18 July, an enemy regimental attack order was captured disclosing that the objective of the enemy was only the high ground immediately on both sides of the Kumsong River.

With rumor and half truths spreading, the withdrawal during the afternoon of the 14th and early morning of the 15th soon became a near panic. Troops streamed south, discarding weapons and equipment as they fled. A considerable number of junior officers were seen discarding their insignia of rank as they fled. Rumors grew as communications deteriorated.

At 1200 on the 14th, the 11th Division was released to Corps control from Army

A daylight withdrawal under strong enemy pressure is one of the most hazardous of all military operations. The ROK II Corps was faced with such a movement during the Battle of the Kumsong Salient in July 1953

received from Corps Headquarters. As a result, many artillery units were on the road simultaneously.

By late afternoon of the 14th, the main supply route in the Corps left sector was a nightmare. Vehicles were bumper to bumper for miles. Steep terrain and traffic

reserve. During the late afternoon of the 14th and early morning of the 15th, this division relieved the 6th Division. The 6th was moved into blocking positions on the Wyoming line in the west half of the Corps sector to block and reorganize. The 3d Division, which was very badly in

to strengthen the Corps against possible counterattacks or renewal of the enemy offensive, the 7th Division was released to the Corps at 1400 on 19 July. That night, the 7th Division moved into the line between the 11th and 8th Divisions. With this adjustment the Corps had four divisions abreast—the 11th, 7th, 8th, and 6th Divisions from west to east (see Figure 5).

Further efforts on 22-23 July to secure

The withdrawal of the II Corps to points further south than the line prescribed by Eighth Army was the result of several causes. At the time the withdrawal order was issued, the real situation was not known at Corps Headquarters. The extent of the withdrawal actually under way was not fully appreciated. It was believed, at the time, that the divisions were still substantially north of the prescribed line. Although Corps Headquarters was never

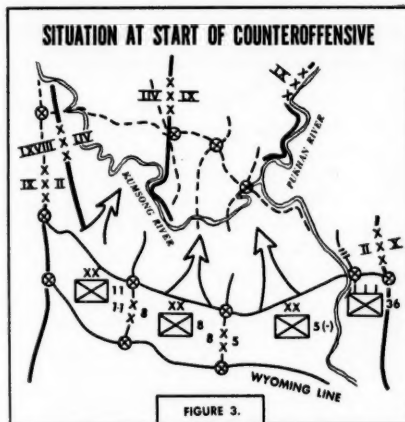


FIGURE 3.



FIGURE 4.

dominant features commanding the Kumson River were unsuccessful despite savage fighting involving battalion size forces. On Army order, no further offensive action was taken after 25 July in view of the imminence of the armistice, which was signed on 27 July.

The Battle of the Kumson Salient—which lasted from the evening of 13 July to the night of 23 July—cost the II Corps thousands of battle casualties and great amounts of equipment. The enemy paid heavily, too, for 210 prisoners of war were taken and over 1,000 small arms and machine guns were captured. Although the exact count of enemy casualties cannot be determined, conservative estimates indicated that the enemy lost well over 25,000 men.

out of communication with the divisions, the divisions were frequently out of contact with their major units. This loss of contact can be laid to the loss and abandonment of communications equipment and the failure to use liaison officers effectively. As in many times in the past, the commander did not have accurate and timely information on which to base his orders.

The use of staff officers at key places along the routes of withdrawal could have helped stem the withdrawal before it gained full momentum. Had this been done, and had subordinate commanders exerted maximum personal leadership, the withdrawal could have been stopped further to the north. When normal control is lost or tenuous, personal leadership

and the use of staff officers at every echelon—regardless of staff assignment—becomes mandatory. Commanders and staff simply failed to supervise the withdrawal adequately.

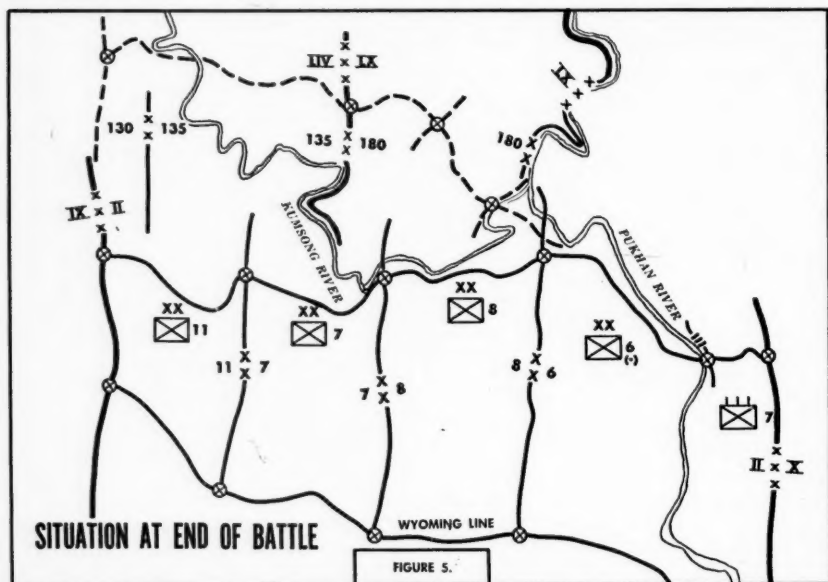
Liaison Systems

The poor liaison system within the II Corps contributed to the rise of near panic and hysteria. While liaison officers from divisions were sent to higher and adjacent units, they were not provided with transportation or separate communi-

panic and confusion. During the withdrawal, the division commanders knew little or nothing of the activities on their flanks.

The breakdown of the system for reporting and exchanging information was the greatest single contributor to the Corps difficulties. Misleading, incomplete, sometimes inaccurate and often unverified reports transmitted as the truth caused many troubles.

The use of helicopters by staff officers to verify troop dispositions and reports



cation facilities. Corps Headquarters had no organic liaison officers. Divisional liaison officers had to rely on existing Corps wire lines for transmitting information. Had the liaison officers had their own radios and transportation, information could have been exchanged both laterally and up and down. Such a free interchange of information would have dispelled many of the wild rumors that spread like wild fire and helped create

was a great help. The extremely small number of helicopters limited exploitation of this means of securing accurate and timely information. The remedy lies not only in greater use of helicopters, but in making the liaison system effective.

The centralization of control of artillery displacement at Corps Headquarters was at too high a level. With communications up the chain of command from artillery battalion to Corps Headquarters

subject to delay and breakdown, an orderly displacement of artillery was impossible. If there is to be centralized control of artillery displacement during a withdrawal, it must be at a lower level to be effective. In this particular situation, where the artillery was not under the division commanders, it probably should have been left with the artillery groups that were furnishing direct support to the divisions. The failure to displace artillery early and by echelon could have been disastrous had the enemy pressed hard south of the Kumsong River and had the enemy exercised his air capability.

In essence, the II Corps was not forced south of the Kumsong River line by enemy pressure. It withdrew beyond the prescribed line because certain commanders had lost control, and communications below division level had broken down. This might well have turned into a disaster had the enemy fully capitalized on the situation. It is to the distinct credit of the II Corps that once control was lost it was quickly re-established and the Corps was able to turn again to the offensive. This speaks well for the inherent leadership qualities and discipline of the maturing Republic of Korea Army.

Summary

In summation, several lessons are outstanding from the Kumsong Salient operation.

1. Commanders and staffs must station themselves at key points in order to personally supervise a withdrawal.
 2. In a withdrawal, the prompt exchange of accurate information—laterally as well as between headquarters in the chain of command—is vital.
 3. No effective liaison system is possible when liaison officers do not have transportation and separate communications facilities.
 4. Displacement of artillery during a withdrawal must be early and by echelon. This type of movement control cannot be successfully centralized at too high a level.
 5. Communications equipment must be given the highest priority in any evacuation.
 6. Helicopters are invaluable aids to staff and commanders in verifying troop dispositions and securing prompt information.
 7. Traffic control is of paramount importance and military police traffic control duty should be augmented in a withdrawal situation.
 8. All personnel must be on the alert to instantly suppress any rumors or exaggerated reports.
 9. No decisions or orders can be any sounder than the accuracy of the information upon which they are based.
- One benefit of this splendid teamwork by soldiers and scientists is the Army's constantly improving equipment, which gives greater effect to the quality of our troops. In general terms, this is accomplished in three ways: By increased mobility, so that by swift concentration, striking forces may effectively attack critical objectives in rapid succession; by arming our men with weapons of increased fire power, which means weapons of greater range, greater destructive effect, and, in many cases, greater rate of fire; and by extending and improving communications so that our increased mobility can be used in the most effective manner—that is, in direct response to the directions of the commander which, in turn, are based upon a momentarily up-to-date knowledge of the situation.

General Matthew B. Ridgway

OPERATION SCHMIDT

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THIS article is based on "Objective Schmidt," one of the operations described in the book, *Three Battles: Arnaville, Alttuzzo and Schmidt*, published as part of the series, UNITED STATES ARMY IN WORLD WAR II.

Operation *Schmidt* has been termed one of the most costly divisional operations of World War II, and it resulted in a major repulse to United States Forces. The purpose of this article is to analyze Operation *Schmidt* in the light of the nine United States Army Principles of War in order to determine whether or not the failure of the operation was caused by violations in the proper application of those principles.

General Situation

In October 1944, the Allied Armies in Western Europe had breached the Siegfried Line at Aachen and east of Rötgen. The main effort of the United States First Army to cross the Roer River and seize crossings over the Rhine River was to be made by the United States VII Corps. Prior to the VII Corps attack, the United States V Corps, which was south of VII Corps, was to launch a limited flank operation with its initial objective to be the crossroads town of Schmidt.

Operation *Schmidt* was expected to accomplish four things: to gain maneuver space and additional supply routes for the VII Corps attack to the north; to protect VII Corps right flank; to occupy terrain from which a later attack could seize the upper Roer River dams; and to draw enemy reserves from VII Corps zone.

Schmidt was an important objective. It was located on a ridge which commanded

a view of the Schwammenauel Dam on the upper Roer River. This dam, which was not an objective for this attack, was one of a series which the Germans might blow in order to cause a flood which would isolate any attack crossing the Roer River in the vicinity of Aachen. Schmidt also was an important road center for supplying enemy forces. Had the Schmidt operation succeeded, the First Army might have reached the Rhine in late November or early December.

Special Situation

The United States 28th Infantry Division was designated by V Corps to make the attack, and it took over its sector from the United States 9th Infantry Division on 26 October. Its front lines extended generally along the Hürtgen-Germeter-Rollesbroich Road which ran through dense forests known to the American troops as the Hürtgen Forest. Numerous enemy pillboxes were hidden in the forests in the southern part of the division zone—particularly around the small towns of Simonskall and Raffelsbrand. To the east from Germeter ran a ridge topped by the town of Vossenack, which was surrounded on three sides by deep, densely wooded draws with minor draws reaching up toward the town itself. (See Figure 1.) To the northeast of the Germeter-Vossenack Ridge was the Hürtgen-Brandenberg-Bergstein Ridge which ran perpendicular to, and dominated, the Vossenack Ridge. Through a precipitous wooded gorge to the south and southeast of Vossenack ran the Kall River, a small, swift-flowing stream. Although a river road ran generally along-

side the Kall River, only a small woods trail led south from Vossenack, crossed the Kall River, and continued up another ridge in the direction of the 28th Division's main effort. On this third ridge were the towns of Kommerscheidt and Schmidt. This ridge also dominated the Vossenack Ridge, with the town of Schmidt dominating the town of Kommerscheidt. Both Schmidt and Kommerscheidt were, in turn, dominated by the Brandenburg-Bergstein Ridge to the northeast. Dense woods and deep draws surrounded the towns of Schmidt and Kommerscheidt.

Planning

Two important considerations influenced the planners of the Schmidt operation. First, air support could isolate the battlefield from large-scale intervention of enemy reserves—especially armored reserves—thus limiting the operation to an infantry action because crossing tanks over the Kall River was a doubtful possibility. Second, artillery support could deny the enemy the advantages of the dominating Brandenburg-Bergstein Ridge. Planners were concerned about the enemy observation from this ridge; however, V Corps had too few troops to assign the ridge as an objective, and, therefore, neutralization by artillery was apparently the only available solution.

In addition to organic artillery, the division had eight artillery battalions in

regiments was virtually dictated by the terrain, the number of troops available, and the missions assigned for the attack. The 109th Infantry Regiment was to attack toward the north in the direction of Hürtgen, in order to carry out a secondary mission of securing a line of departure overlooking Hürtgen from which another division could later take Hürtgen. This regiment had the additional mission of blocking against counterattacks from that area since, in a prior attack aimed for Schmidt, the 9th Infantry Division had been fiercely counterattacked from the direction of Hürtgen. The attack on Hürtgen was to be a part of the main effort of First Army to be made by VII Corps. The mission of securing a line of departure for the later attack was specifically assigned by First Army. (See Figure 2.)

The 110th Infantry Regiment was directed to attack through the dense woods to the south to secure a road from Schmidt to Strauch which could be used later in the planned co-ordinated attack to roll up the defenses facing Monschau. One battalion of the 110th Infantry was to be held out initially as the division's only infantry reserve.

In the center of the 28th Division zone, the 112th Infantry was to make the division's main effort, and was assigned the capture of Kommerscheidt and Schmidt. It had the secondary mission of protecting its own north flank by the capture and

The Principles of War adhered to by the United States Army must be applied to the very maximum at all times, both decisively and correctly, if we are to ultimately achieve success in any future operation

direct or general support of its operation. Attachments to the division included one medium tank battalion, two tank destroyer battalions, a 4.2 chemical battalion, and an engineer combat group of three battalions.

The 28th Division's employment of its

defense of Vossenack and the Vossenack Ridge. To accomplish its assigned missions, the 112th Infantry planned to send its 2d Battalion to capture Vossenack and the ridge. The 1st Battalion was to attack southeast through the wooded draw south of Vossenack, crossing the Kall

River in a cross-country move and take Kommerscheidt. The 3d Battalion was to follow the 1st Battalion on order and capture the final objective, the town of Schmidt.

Two major factors influenced this deviation from the tactical doctrine of convergent attack: the lack of troops available for the operation, and the necessity for performing the three divergent initial missions—securing a line of departure overlooking Hürtgen and protecting the north flank against counterattack; clearing the main route south toward Strauch in preparation for the latter phase of the attack; and capturing the primary division objective, the town of Schmidt.

The 28th Division G2 estimated that to the immediate front, the enemy had approximately 3,350 men, to the north 1,940, and to the south 1,850, all of whom were elements of the German 275th Infantry Division. Enemy reserves capable of rapid intervention were estimated at 2,000 not yet committed and 3,000 capable of moving from less active fronts. The G2 estimate did not mention that Schmidt and the Roer River dams were, perhaps, of more concern to the enemy at the time than any other specific objective on the western front short of the Rhine crossing.

The artillery plan called for conventional fires on known and suspected enemy locations and installations. The preparation was to begin all along the V Corps

front and the southern portion of the VII Corps front at H-60 minutes. At H-15 minutes, the fires were to shift to local preparations. After H-hour, fires were to be in close support on-call of the infantry. Counterbattery fires were based primarily on sound and flash recordings, since weather, prior to the attack, limited air observation. Artillery ammunition was limited but was considered adequate.

The Operation

The operation was originally scheduled for 31 October, but it was postponed because of bad weather. The attack jumped off at 0900 on the cold and misty morning of 2 November. The 2d Battalion, 112th Infantry, seized Vossenack and Vossenack Ridge by noon, and dug in. The 1st Battalion, 112th, making the division main effort, jumped off on schedule at H+3, but its leading company immediately ran into resistance. By nightfall, the division's main effort was only 250 yards from the original line of departure and had dug in for the night.

To the north, the 109th Infantry attacked toward its objectives at 0900 with two battalions abreast. By nightfall, it had taken part of Objective 1 on the left, and had advanced from 300 to 500 yards on the right.

The 110th Infantry attacked toward Strauch at H+3, but both of its attacking battalions were stopped after almost no gain by determined resistance and heavily fortified pillboxes. The 1st Battalion, 110th Infantry, was the division's only infantry reserve and was not committed.

Air support during the first day's operations was negligible as far as the 28th Division was concerned. Weather had prevented takeoff until afternoon, and only one mission was actually accomplished in support of the division. It must be remembered that one of the major considerations in the planning for this operation was that the area could be isolated

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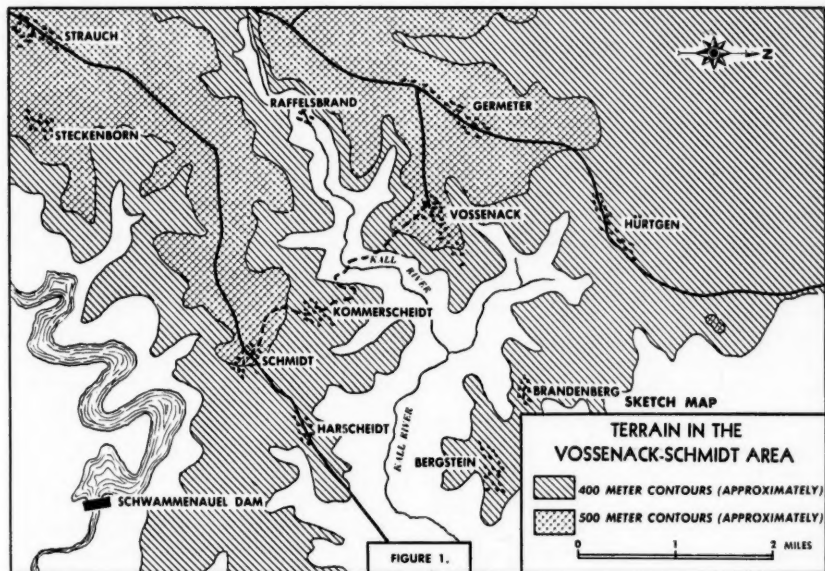
from large-scale intervention of enemy armor by air attack.

3 November

The 112th Infantry resumed its attack toward Kommerscheidt at 0700, 3 November, in the same type of weather that characterized almost the entire Schmidt operation—cold, but not quite freezing, with a heavy mist hanging about the wooded draws. Visibility was poor, and employment of aircraft was doubtful. The

they were eating or had just eaten, while others were caught as they rode into town on bicycles or motorcycles without any apparent thought of danger. Mopping-up operations were suspended shortly after dark, and defenses were readied. The 1st Battalion, which followed the rapidly advancing 3d Battalion, closed in the Kommerscheidt area about 2100, and prepared for the defense of that town.

As the infantry pushed ahead, the 20th Engineer Combat Battalion commenced



advance of the leading battalion was rapid with only light resistance being encountered from enemy ground elements.

By 1300, the initial objective, Kommerscheidt, had been captured against virtually no opposition. The battalion immediately pushed on toward Schmidt, and reached the objective by 1430. They found little resistance from the enemy in Schmidt. The attack was evidently a complete surprise to the Germans. Some of them were captured in the houses where

work on the Germeter-Vossenack-Schmidt trail. The trail became very steep after leaving Vossenack and entering the wooded gorge, and consisted of a kind of shelf with a dirt wall and rock obstructions on the right. To the left of the trail, the bank dropped off sharply. Attempts to get tanks down the trail on 3 November were unsuccessful, and only one infantry supply train—of three *M-29 Weasels* loaded with rations, ammunition, and some antitank mines—was able to get

through to Schmidt during the night. Fifteen hours had passed since the capture of the division objective, but no other vehicular traffic managed to get through on the night of 3 November.

The situation of the 109th and 110th Infantry Regiments did not change much during 3 November. The 109th Infantry repulsed two German counterattacks during the morning, but was unable to push it forward.

In the woods to the south, the 110th Infantry made several attacks during the day in attempts to get by the pillboxes in the Raffelsbrand area, but neither of the attacking battalions gained any ground, and both suffered heavy casualties. Orders were received during the day from the division commander to commit the division reserve—the 1st Battalion, 110th Infantry—the next morning in an attack to outflank the pillboxes from the direction of Vossenack. Commitment of this battalion would leave the 28th Division with no infantry reserve.

Weather again prevented any large-scale air support throughout 3 November, thus further delaying the isolation of the battlefield by air.

4 November

A few minutes before sunrise, the enemy opened up with artillery and pounded the town of Schmidt. Enemy infantry and tanks commenced an assault on the town from three directions, with only the route toward Kommerscheidt being left open. Enemy tanks soon plunged into town and overran the defenders. A total of 20 to 30 tanks and an estimated German regiment took part in the attack on Schmidt, and the defending battalion was forced to evacuate the town in groups in the direction of Kommerscheidt. By 1100, Schmidt had been abandoned. (German documents captured later confirmed the estimate of enemy strength attacking Schmidt. A regiment of the

German 89th Division, supported by a tank group from the 116th Panzer Division, hit Schmidt with two battalions from the north and east, and one battalion from the southwest. The enemy artillery support included the artillery of six divisions plus assault guns, antitank and mortar battalions.)

Back at Kommerscheidt, one tank had been able to reach the 1st Battalion before dawn, and two others had crossed the Kall River and were on the way up the steep trail. However, five other tanks had become disabled along the trail leading down to the river and blocked the route to other vehicles. Only one engineer company and an additional platoon, equipped with hand tools and an air compressor, but without demolitions, were actually working on the trail. There were no security forces blocking the north-south river road, both ends of which led into enemy territory.

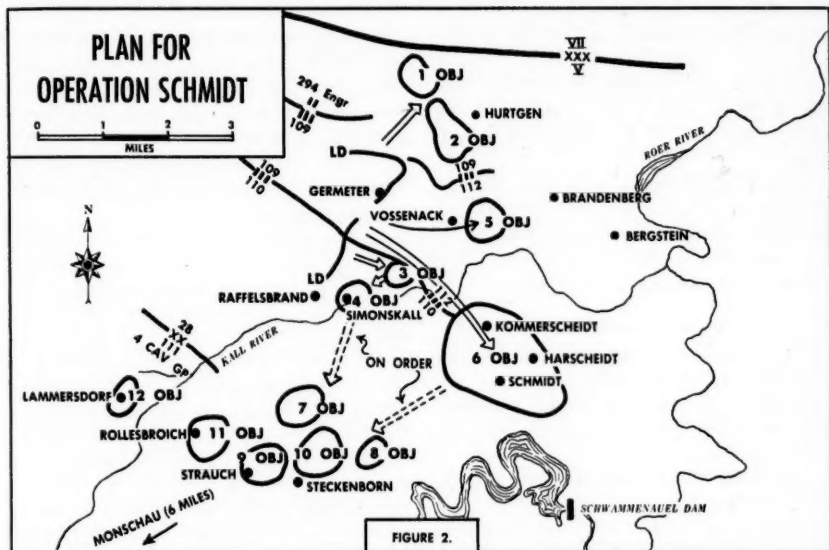
Although the enemy did not immediately push his attack toward Kommerscheidt, artillery fire and direct fire from tanks in Schmidt harassed attempts at organization of the position. The first enemy attack came at 1400, when at least five enemy tanks, accompanied by a small force of infantry, attacked from the south-east. By 1600, this attack had been beaten off with the support of the three United States tanks which had been able to cross the Kall River and reach Kommerscheidt. The defenders sustained numerous personnel casualties, but in the process, they knocked out at least five German tanks without losing any of their own three.

Misinformation throughout the day of 4 November kept division headquarters ill-informed about the condition of the vital main supply route across the Kall gorge. Most reports repeatedly asserted that the supply route was open, thus contributing to failure of commanders to realize the seriousness of the situation. Neither regiment nor division had liaison officers on

the spot. At 1500, the division commander took a personal interest in the work, and by 0400 of 5 November, the trail was open for vehicular traffic.

Weather was again the controlling factor in the air support of Operation Schmidt on 4 November. The first air at-

To the south, the 110th Infantry held with two battalions and used the division reserve to attack from the direction of Vossenack. The attack was successful in taking the small town of Simonskall against minor resistance. However, when the other two battalions sent out patrols,



tack of the day hit Schmidt after the 3d Battalion, 112th Infantry, had been driven out. Schmidt and its environs were bombed and strafed by three squadrons during the day. Other squadrons had to cancel missions because of weather. The large-scale intervention of enemy armor was proof enough that air support was not accomplishing the vital mission of isolating the Schmidt battlefield.

In the zone of the 109th Infantry, little change was made during the day. The enemy infiltrated a number of patrols and was successful in capturing or killing most of one battalion staff and the artillery liaison party. Attempts to continue the attack toward assigned objectives were stopped by mines and small arms fire.

they found the enemy still facing them in force and they showed no inclination of withdrawing.

5 November

The situation was relatively stable in Kommerscheid throughout 5 November. The infantry held against three minor German assaults, and the defenses were bolstered by the addition of five tanks (making a total of eight) and nine tank destroyers—one of which was knocked out in fighting during the day. The troops of the 1st and 3d Battalions, 112th Infantry, were so intermingled within the town, that a combined command was established, and the defense of the town was placed under one commander.

In the Kall gorge, the Germans gained

the upper hand during the night of 5-6 November. Supply trains were ambushed, engineer groups were attacked, and Germans were sighted throughout the area. For all practical purposes, the Germans controlled the vital river bridge and sat astride the main supply route between Vossenack and Kommerscheidt. The 28th Division's G2 periodic report for 5 November, in making estimates of enemy capabilities, had failed to mention the possibility of such enemy action coming down either end of the undefended Kall gorge.

There were virtually no changes in dispositions of either the 109th Infantry or the 110th Infantry throughout the day as they continued to try to force their way toward their assigned objectives.

6 and 7 November

In Kommerscheidt, the combined 1st and 3d Battalions, 112th Infantry, withstood very heavy artillery and tank shelling throughout 6 November, but their own artillery, tank and tank-destroyer fires kept the Germans from launching an attack. Infantry casualties mounted and four of the remaining seven tanks had their turrets jammed. The men of the remaining infantry battalions together could hardly have mustered two full-strength rifle companies.

Just before daylight on 7 November, the Germans again started their bombardment of Kommerscheidt, and followed with an attack of an estimated 2 battalions of infantry accompanied by 18 tanks. By about 0830, the enemy had infiltrated the town, and the situation rapidly deteriorated. By midday, the town was in enemy hands.

During the afternoon of 7 November, the decision was made to withdraw all forces from east of the Kall River. This decision by the division commander was concurred in by the corps and army commanders. This withdrawal was accomplished—with difficulty—on 8 November.

The 109th Infantry was relieved by the 12th Infantry Regiment of the 4th Infantry Division on 7 November, and it, in turn, relieved the 112th Infantry Regiment in the Vossenack area on 8 November. The 109th had never completely succeeded in securing the desired line of departure for the proposed Hürtgen attack.

The 110th Infantry action was bloody and costly and accomplished very little other than securing Simonskall. When relieved in this area, it was in little better position to accomplish its original mission than when it began. Its nemesis had been the pillbox-infested Raffelsbrand strongpoint.

In the final analysis, virtually all that the 28th Infantry Division attack accomplished in terms of territory gained was the capture of Vossenack and Simonskall, and the partial capture of a line of departure for another division's attack to the north. Only one of the four things which had been expected as a result of Operation *Schmidt* had been actually accomplished—the mission of drawing enemy reserves into the area from the VII Corps zone. Before the Schmidt operation was concluded, elements of three German divisions were committed. However, even this success was entirely negated by the failure of the First Army attack to get off on time in the VII Corps zone. By the time this later attack did jump off, two of the three German divisions engaged had moved to the north, one to the defense of the Hürtgen-Brandenberg-Bergstein area, and the other even farther north.

The division's losses (including attached units) for the operation were 6,184 Americans. Of these, 2,093 officers and men were lost from the 112th Infantry Regiment. Enemy casualties—documented by German records after the war—were 913 prisoners of war, and 2,000 estimated casualties of all types—a total of 3,000 less than our losses. American matériel

losses included 16 *M-10* tank destroyers, and 31 medium tanks which were lost in the actions at Vossenack, along the Kall trail, and at Kommerscheidt and Schmidt.

The failure of Operation *Schmidt* can be attributed to a combination of many things. Among them were:

1. Our failure to isolate the battlefield by air and artillery.
2. The adverse weather conditions.
3. The difficult, inadequate, and unprotected main supply route.
4. Our failure to get sufficient armored support across the Kall River.
5. The circumstances which placed elements of the German 89th Division near Harscheidt at the time the 112th Infantry took Schmidt.
6. Our failure to include plans for taking the Brandenburg-Bergstein Ridge. This would have necessitated the use of another division.
7. The importance the Germans attached to the Roer River dam area and which caused their violent reaction when the area was threatened.

There were other reasons, no doubt, but these were considered the most important.

Analysis of the Operation

It would be well to start off an analysis of Operation *Schmidt* with what has been called the fundamental Military Principle—the Principle of the Objective. In brief, the Principle of the Objective dictates that all activity must be directed toward a clearly defined goal, a goal which, when taken, will result in the accomplishment of the assigned mission. If a secondary objective does not contribute to the attainment of the primary objective of a unit, it is not a proper objective for that unit.

The Objective

The primary objective or goal of Operation *Schmidt* was the capture of the town of Schmidt and the high ground in

the vicinity thereof. Intermediate objectives which were assigned did not all contribute to the attainment of that objective, particularly the attack toward Hürtgen to seize a line of departure for an attack by a division of the neighboring corps.

The actual failure to apply the Principle of the Objective in assigning missions to the 28th Infantry Division was made by V Corps. They might better have designated some other combat unit to take the northern objective and avoided splitting the effort of the division. This failure to direct all activity toward the goal or primary objective resulted in a dispersion of the forces of the division to such an extent that the objective, although seized, could not be held.

Mass

Dispersion of forces leads to a discussion of the Principle of Mass. This principle dictates that maximum practicable military superiority must be achieved at the decisive place and time. The maximum available combat power must be employed in a decisive direction. The objectives which were assigned to the division led to a scheme of maneuver which dissipated the strength of the division and weakened its main effort. The lack of an adequate main supply route across the Kall River resulted in inability to get sufficient tanks across to the infantry, with the result that the division was not able to attain superior combat power, and the Germans were able to overrun the infantry in Schmidt and force the defenders out of Kommerscheidt. Unfavorable weather conditions precluded the employment of the planned air support which might have prevented the Germans from attaining superiority in men and matériel at the decisive place. However, insofar as the ground effort was concerned, the Principle of Mass was not applied in either the planning or the execution of the operation.

The Principle of Maneuver is very

closely linked with the Principles of the Objective and Mass. Maneuver involved the positioning of available military resources to favor the accomplishment of the mission. Initially, the 28th Division attempted to position its forces in favorable locations in light of the assigned missions. The greatest weakness in the Principle of Maneuver as applied to Operation *Schmidt* was the late development of the Kall River trail which prevented getting sufficient armor strength across the river and up the eastern slope to support the infantry. By inability to properly position military resources, our forces were unable to hold the objective. The shifting of maneuver of supporting artillery fires was one of the factors which permitted elements of the division to remain across the Kall River as long as they did.

Unity of Command

The Principle of Unity of Command means that every task should have unity of effort under one commander. This principle, in effect, provides for the decisive application of maximum available combat power toward the attainment of the objective. In Operation *Schmidt*, although the division commander had supreme authority over his unit, he still did not get unity of effort toward the attainment of his primary objective.

The assigned objectives prevented the division from exerting its maximum power in one direction and, therefore, the Principle of Unity of Command was not fully applied in this operation.

The principle might better have been applied had the division been able to complete its attack to seize the Hürtgen line of departure before jumping off in the attack on Schmidt. In such a case, the full weight of the division might have been applied in turn against each objective, rather than splitting the effort of the division so as to attack both the Hürtgen

line of departure and Schmidt at the same time.

Simplicity

Because of the assigned objectives, and the resultant scheme of maneuver to seize those objectives, the Principle of Simplicity was not properly applied. Simplicity implies the preparation of uncomplicated plans and clear, direct, and concise orders. The plan for the advance after the seizure of initial objectives envisioned a 90 degree change of direction for both the 110th and 112th Infantry Regiments and, therefore, the basic plan was not simple. Had the 112th actually started an attack southwest from Schmidt, no forces were available to leave in Schmidt to protect the rear of the regiment as it moved southwestward. That particular weakness in the planning was never exposed in the actual operation.

The Principle of Economy of Force, which involves an allocation to the secondary effort of the minimum essential combat power consistent with security, was not fully applied. The attack to seize the Hürtgen line of departure was a secondary effort of the division, and yet one-third of the division's forces were committed to that effort.

In the zone of the 110th Infantry, economy of force was applied to some degree both in the assignment of a wider zone than that of the main effort, and the withholding of one battalion of that regiment for division reserve. By so doing, minimum essential force was employed on this secondary effort.

Security

The Principle of Security includes all measures taken to prevent effective hostile interference with operations. The enemy must never be permitted to gain an unpredicted advantage. Security requires a correct estimate of enemy capabilities, and readiness for action against those

capabilities. In the Schmidt operation, the G2 estimate did not recognize the importance of the Roer River dams to the enemy, and the quick and strong reaction of the enemy to any threat against the possession of them. G2 was not aware of the relief being effected in the German positions immediately southwest of Schmidt. This resulted in a second German division being immediately available to counterattack the penetration of the German lines in front of Schmidt. Therefore, we did not have security in our knowledge of the enemy situation facing the 28th Infantry Division. The withholding of one battalion of the 110th Infantry Regiment as division reserve did not provide sufficient security to the main effort of the division. When the main effort was counterattacked, the reserve was not ready for action to assist in repulsing the attack.

In the development of the Kall River trail, the only security provided against roving bands of Germans was the local security of the engineers working on the trail. By the third day of the operation, the Germans were interdicting the main supply route of the division with patrol action, placing mines, ambushing supply parties, and taking prisoners. This was permitted by failure of the division to provide security forces on either side of the trail, or for ensuring that the engineers accomplished the task which had been included in the planning. However, the requirement that the engineers were to be responsible for the security of the main supply route was not included in the order.

The Principles of Surprise and Offensive were properly applied in themselves; however, because of the lack of mass to

follow through, the element of surprise was lost as well as the initiative. The Germans certainly did not anticipate that such a relatively small force would attempt such an ambitious project over the difficult terrain in the Schmidt area. A common failure in the employment of surprise is to fail to employ it with mass.

Conclusions

A number of reasons have been pointed out to show why Operation *Schmidt* was a failure. The analysis of the operation against the nine United States Army Principles of War shows that only two of the principles were properly and fully applied. The fundamental military principle of the objective was violated and with that as a starting point, the troubles of the division multiplied. The selection and assignment of the proper objective is the first and most vital step in the application of the principles of war. Improper objectives assigned to the division led to the dissipation of the ability of the division to achieve maximum practicable military superiority at the decisive place and time. It was this lack of superiority or mass which was the overriding consideration in the failure of the 28th Division's attack.

In analyzing this operation, it is admitted that hindsight is better than foresight. Following the Normandy landings, there had been many successful operations which had begun as gambles. Schmidt was a gamble that failed, and it provides the reader of military history with an excellent example of the need for applying all of the principles of war all of the time to the maximum practicable extent. Failure to use them decisively and correctly can be fatal to success.

WHAT MAKES LUKE RUN?

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

LUKE—the Marine Corps word for Chinese—apparently came into being during the Korean conflict. It is not a derogatory term, for most of the men who fought *Luke* respect him as a first-rate fighting man.

They were a poor lot when the author first saw them in their homeland in 1946 and 1947. However, when he met them again in Korea, he found they were much improved soldiers and bore little resemblance to those he had known before.

The reasons behind this change became important to the author. The reasons began to appear only after extensive reading of Edgar Snow, Nym Wales, and *Time* reporters Jacoby, White, and Forman—among many others. This article is an attempt to explain the changes which have come over *Luke* and what brought them about—in short, what makes *Luke* run.

There was an odd custom in the ancient land of China which it seems has fallen into disuse. When two powerful leaders felt they had to battle, they would settle it in a rather bloodless way. Over a conference table they would tell each other the strategy they would have employed in conducting war. After due consideration of the problem, the one who felt he would have been the loser would make a cash settlement and they would part—if not friends, at least none the worse except for

the loser's pocketbook. I mention this because as we have recently discovered, those who made the initial steps forward in gunpowder and other battlefield developments have gone back into the business. Now that the affair in Korea is at least temporarily halted, we had best see just what it is that makes *Luke* run.

Old China hands were prone to discount any value of the fighting men of that country. Generally speaking, their beliefs were well founded. Armies were the special property of war lords who were given sums of money for the maintenance of the armies by the reigning government. Imagine giving our division commander a large sum of money to maintain his division for a year without any special requirement or accounting. All the problems concerning what the troops are fed, where they are billeted, how much they are paid, who gets promotions and how often, what training is received, and on down through the military field were made the responsibility of one person. The men in the division would be governed in accordance with the particular beliefs of that one man. One can imagine that sometimes the soldiers were not given the best treatment.

Promotion System

The promotion system was simple, but not very effective in view of the results obtained. In simple terms, it was a case of buying men for the ranks and selling command positions for whatever the traffic would bear.

A general would sell all of the senior positions within the unit. The purchasers would, in turn, sell the junior position, and

so on. The men for the ranks were sold into the Army by parents who could not afford to feed them. Needless to say, an Army so organized was hardly an effective fighting machine.

However, upon the advent of Sun Yat Sen things began to look a bit better. Granted, some of the same practices remained, but there were some men in the government who were honestly interested in helping build a true fighting force for the country. It was also clear by this time that there were two distinct camps in China which were not compatible, although they were willing to hold together at least for a time. These were the Kuomintang and the Chinese Communists. As early as 1923, Sun Yat Sen was trying to make it clear that the two had to remain together.

This rather dubious union lasted until the year 1927—after the remarkable Sun Yat Sen had passed to his reward and Chiang Kai-shek had led his successful troops to Shanghai. At this point, the separation was made with the rather strong warning that anyone who joined the Communists became subject to the death penalty, if caught. To show that it meant business, the reigning government went to work methodically and there were countless executions. It appears that it missed the real leaders of the Communist movements, however, as later events have proved.

By 1934, the situation had caused great

munist Army made its epic withdrawal to the northwest—hounded all the way by the Nationalist troops.

History offers nothing to parallel this withdrawal. Outnumbered by what has been estimated as more than 300 to 1, the Communists originally centered at Juichin and made a break for the north. Once they had cleared the area of Hunan, they were never again afraid of entrapment while on the march. It is interesting to note that in the units which survived, there were hundreds of "little devils," age 11 to 14, who had joined as orphans and learned the trade of the fighting man on the battlefields. When the Chinese Communists entered the Korean conflict, those who had lived were less than 35 years of age.

In the early 1930s, the Japanese were not only flexing their imperialistic muscles, but were actually digesting large pieces of China. In retrospect, it seems ridiculous that when the Nationalists and Chinese Communists both claimed they were anti-Japanese, they continued to fight pitched battles against each other during this period.

This sad situation continued until 1938, when the Japanese shocked the world with their rape of Nanking and Chinese blood boiled. Once again the two groups united for joint action against the Japanese.

Most reports bear out the fact that this period was an uneasy one for the Generalissimo. Not wishing to allow the Com-

This is the time to analyze the Chinese and find out what makes them run so we can deal with them more intelligently in the future. Should it not be a part of our "know thy enemy" policy to also "know thy friend"?

internal dissension in the vast lands of China, and the Government of Chiang pressed forward to completely eradicate the Communists. Perhaps here we might find the beginning of the present-day Chinese fighter. Vastly outnumbered and with very little to aid them, the Chinese Com-

munists to become too strong, however, he was bound to assist them, so his problem was that of making sure that they were not given more than enough. It was a difficult position.

Obviously the Japanese knew of all these things and using the old axiom of *divide*

and conquer, they made pleasant overtures to members on both sides of the political fence. Sad, but true, is the fact that they were sufficiently successful with the Nationalists to establish puppet governments with their aid. Although these governments gave the outward appearance of stability, they actually had many problems. Inside what the Japanese considered the "occupied area of China" there were, in many places, strong bands of the Communists. It was at this point that *Luke* developed his real tactical abilities.

As noted, the Communists were accustomed to fighting far superior forces and had been able to stay alive despite the fact that they did not employ practices generally attributed to be essential to a fighting force. Now that they had but one enemy, they began to use what might be called "hit and quit" methods. Since the Japanese were spread thinly over large areas, the guerrillas were able to keep Japanese lines of communication in constant danger.

New Tactics

After many small Japanese groups had been ambushed and several annihilated, the Japanese trend was toward larger groups. However, even this was not a solution to the problem because the Chinese dictated when and where the attacks were made and, therefore, were able to gather sufficiently large forces to ensure results. The Communists, in this manner, were able to destroy Japanese forces, to gather and remove captured weapons and equipment, and flee before the main Japanese forces pursuing them arrived.

According to accounts, there was an

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average of at least one battle a day during 1938, and two a day during 1939. If ever troops were educated in the crucible of battle, these Communist troops were.

We should not, however, sell the Kuomintang forces short on experience during this period. They, too, had intimate daily contact with Japanese forces. In several major engagements, both the Kuomintang and Communist forces displayed an ability for real joint planning.

Both Germany and the Soviet Union had military advisors attached to the Chinese forces. It is believed by many that, had the plans outlined by these advisors been followed, the Japanese position would have been untenable. However, their advice was not followed and close co-ordination between the two Chinese forces was never effected. The Nationalist forces, who had spent years in pursuit of the Communist forces, continued their battlefield education.

Familiarity Breeds Understanding

There is another important factor which we should consider at this point—the passive attitude of the Chinese to aircraft. *Luke*, in the Korean conflict, all but ignored air attacks. Many of our pilots reported that when they attacked a Chinese column, most of the men would merely squat down to reduce the size of the target and wait patiently. When it appeared that the attack was over, they would rise and continue on their way.

The Japanese had used the airplane over a considerable portion of China for an extended period. Almost any target was considered fair game for Japanese aircraft. Two peasants working in a rice paddy were considered a profitable target, and, if the plane happened to have a spare bomb aboard, that, too, might be used. Perhaps because *Luke* was accustomed to air attacks, he failed to give them more than a passive reaction. Familiarity, in this case, did not breed contempt, but

rather it bred a set of rules which provided a passive protection and paid dividends in Korea years later.

American troops have never had any fear of air attacks, however, their reason has been that our forces have always had air superiority. If and when our air superiority is lost, we might be sadly matched against the experienced *Luke*.

Oriental Cave Man

In the same manner, we do not compare favorably with *Luke* when it comes to digging in. *Luke* has continually demonstrated his ability to dig in and consolidate his holdings rapidly, while the average American soldier must be forced into digging in sufficiently to protect himself.

Given the time, *Luke* will dig in to a depth of 6 feet and then start connecting trenches at the same depth. *Luke* has probably established a record for extended combat over the past decade. He lived in caves when he fought the Chinese Nationalists and again when he fought the Japanese forces. Is it any wonder that he has been hard to move from his underground positions in Korea? This affinity for cover has certainly cut down the number of casualties he would otherwise have suffered.

Weapon's Shortage

Most modern armies issue individual weapons to soldiers who serve in or near the theater of operations. Chinese Communist units have been known to make full-scale attacks in which only half of the assault force carried individual weapons. This, of course, was a matter of necessity rather than policy for the Chinese Communist Forces have long suffered from the lack of central supply sources and have had to depend, to a great extent, upon weapons and equipment which they captured on the battlefield.

Edgar Snow, Nym Wales, and other writers who were familiar with earlier Chinese engagements write of large or-

ganizations which were able to supply only one-fourth of their men with rifles. Even as late as 1939, the Chinese Communist New Fourth Army—with the backing of the Nationalists—was reported to have had a strength of 40,000 men and less than 20,000 rifles.

This shortage of weapons was sufficient reason for a careful husbanding of the weapons and equipment. When an assault was made, it was a standard practice to assign each armed rifleman a man armed with a hand grenade or two and perhaps a knife. It was the duty of this man to accompany the rifleman and rescue the rifle and use it in the event the rifleman was killed.

The initial attack was frequently made by men armed only with hand grenades or home-made hand bombs because the heavy casualty rate precluded the risk of losing so many individual arms. While this is difficult for us to understand, it is simple Chinese logistics.

Chinese Logistics

Logistically speaking, the Chinese Communist Forces have about the lowest per capita requirement of any present-day army. Having been accustomed from birth to only the bare minimum of food and clothing, frugality imposed no hardship upon the average Chinese soldier but was merely a continuation of the only life *Luke* had ever known. The supply of clothing is somewhat simplified if each man is expected to wear his clothing until it falls apart, and it is further simplified if the man does not resent such a system. It is difficult to picture such a system in the American Military Establishment.

Morale

At this point, the reader is probably wondering about the morale of these underpaid and underfed soldiers. During the entire Korean conflict, it was rumored that *Luke* was unhappy with his lot; that he was living in caves with little to eat,

and with little or no medical care, and that he was under almost constant artillery and small-arms fire. Yes, *Luke* lived under these conditions and he was subjected to constant Communist propaganda, but in spite of these conditions, there were never wholesale desertions from the Chinese Communist ranks.

If we look at the vast stores of materials and the gigantic efforts we made to provide better living conditions and entertainment for our troops, the comparison becomes ridiculous. When we compare our background to *Luke's*, the differences come into focus a little sharper.

The fact that *Luke* is living in a cave is impressive until we stop to consider that the cave is as good as, or better than, the streets and alleys to which he was formerly accustomed. The fact that he is poorly fed is certainly softened by the reality that he is eating regularly for, perhaps, the first time in his life. And, if his clothing is poor, it is still better than any he has ever known before. Because he has never known entertainment or recreation, his present lack is unnoticed and unimportant and his realization that his life is frequently endangered presents no deviation from the normal pattern. It all boils down to the fact that you cannot take something away from a person who has never had anything, and if *Luke's* lot is a poor one, by our standards, it is probably better than any he has ever known.

Perhaps the major difference between *Luke* in Korea and the Chinese soldier of the 1940s is that today *Luke* has a new social status. Whereas the Chinese soldier once occupied the lowest rung on the social ladder, *Luke* holds a position of pride in the eyes of his countrymen today. Is it any wonder that *Luke* enjoys this new sense of importance? Can he be expected to desert and risk the torture and death with which he has been threatened? It is quite possible that *Luke*, who has been pictured as being unhappy, is proba-

bly far happier than he has ever been in the past.

Let us stop here and review what we have established, thus far, in our picture of *Luke*. He was born in a land where war, or the threat of war, has been present since his birth. *Luke's* lot had been such a poor one that almost anything was an improvement—Korea offered no new hardships. In the past few years, he had been given a new and better social status. As a member of the Chinese Communist Army, *Luke* had been rewarded for the first time with a dignity of sorts—the dignity of a first-class fighting man who had learned his trade on the battlefield. *Luke* has become a soldier capable of giving more than a creditable performance in battle.

Considering that *Luke's* homeland has a population of more than 400 million is certainly impressive. Those of us who had observed *Luke* before were impressed with his development during the past few years from an inferior to a first-rate soldier. *Luke* does, however, have some weaknesses worthy of mention here.

Weaknesses

Perhaps the outstanding weakness of the Chinese is his inflexibility. Numerous instances are on record where Chinese leaders, once committed in a plan of battle, have been unable to adjust their plan to suit the situation. Although his casualties were mounting to staggering heights, the commander frequently continued to throw fresh troops into the same spot where his losses were the greatest. In spite of the fact that in most instances the original plan was usually the best possible plan, there are few examples recorded where the Chinese Communist commander was able to redirect his thinking when this plan failed. This was true of units up to, and frequently above, the regimental level.

Peculiarly enough, the method of operation appears to have had the sanction of

the principal powers of the Chinese Communist Army. The futile defense of Shanghai by the Nationalist forces would indicate that this inflexibility was a common failing of the Chinese soldier. Nationalist losses during the 4 months they held the line against the Japanese at Shanghai are estimated at between 60,000 and 100,000. The only order given there was to stand fast—and it was never changed.

Communications

The two principal contributing factors to the Chinese communication problems were a lack of suitable equipment and the high illiteracy rate of personnel. Without communications equipment, messengers became the chief method of relaying information. Illiteracy complicated the writing as well as the reading of messages. And even when the reader and the writer were not illiterate, their task was complicated by the many Chinese dialects.

It is reasonable to assume that faulty communications may have played an important part in the Chinese inability to change their plan once they had committed their forces. The Communists, however, must be given credit for trying to correct the deficiencies. They have established classes which have already reduced the illiteracy rate and promise—as more teachers are trained—to obliterate it entirely.

Luke's difficulty in adjustment to Army life is quite different from that of the

average American's. *Luke's* problem is not one of becoming accustomed to regimentation and discipline, but in dealing with the little equipment which is issued to him. Since he has had no mechanical background, his weapon is, to him, highly complex. As the complexity of the equipment increases, so does the confusion of the Chinese soldier.

The average American has driven several types of motor vehicles by the time he is 20 years old. The average Chinese of that age has infrequently even ridden in a car or truck. If the Chinese Communists' campaign to industrialize their mainland is successful, this deficiency will be corrected but the change will, of necessity, be a slow one.

Inscrutable *Luke*

Napoleon once said, "China? There lies a sleeping giant. Let him sleep for when he wakes, he will move the World." Knowing the number of years that have passed since this statement was made, we might ask, has the Chinese giant finally awakened? In Korea, many times *Luke* certainly appeared to be awake. There were also times when he appeared stupid—but perhaps many things we did may have appeared stupid to him.

This is the time to analyze and find out what makes *Luke* run so that we will know how to deal with him as a friend or as an enemy. Should it not be a part of our policy of "know thy enemy"—if God be willing—to also "know thy friend"?

Historically, China always has been something of a power vacuum. At present, Mainland China is lost to the free world. Today, we recognize that the Chinese Communists have considerable military capabilities of their own, and that they would like to extend their domination to certain adjacent territories. The strategic importance, therefore, of Japan, Formosa, the Philippines, and Indochina is obvious to all.

Admiral Arthur W. Radford

South Russian Campaign: 1919

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

ON 14 SEPTEMBER 1812, Napoleon entered Moscow. He anticipated finding a broken people and a dissolute army; instead, the city was a tomb. All but the infirm had evacuated into the frozen countryside. His lines overextended, his armies demoralized by starvation and the freezing weather, Napoleon found, not the relief for which he hoped, but a naked city and a people who attempted to reduce their capitol to ashes rather than let the invader capture it. Such was the nascent nationalism of Russia.

Nearly 50 years later, the military theorist, Karl von Clausewitz, propounded his theory of mobile defense, which rests upon the principle of trading space for lives and time. Russia has invariably used this active defense, defending territory inch by inch, with sudden withdrawals and even more sudden counterattacks in an attempt to reach the enemy rear and cut his communications. Because the defenders operate from the interior position, these counterattacks could be brought to bear on the opponent's weakest point. Thus, every attempted advance into Russia was doomed to failure; the invader was swallowed in the vast terrain.

In 1919, General Anton Ivanovitch Deniken was Commander in Chief of the Armed Forces of South Russia in the bitter civil war which followed the Bolshevik

Revolution. Had Deniken taken Moscow, the history of Russia, and possibly the world, would have been profoundly changed. What were the reasons behind his failure? In addition to the sociopolitical causes, the failure of the White armies was due to many of the strategical mistakes made by previous campaigners.

With the close of World War I on 18 November 1918, Deniken hoped for substantial assistance from the Allies. The British and French did land troops and equipment, but the quantities supplied were far short of the aid not only hoped for, but promised. Despite the lack of Allied help, Deniken possessed several advantages at the outset of the civil war. His forces occupied most of Caucasia up to Rostov, and were engaged with half-prepared, ill-trained Red troops, led by former czarist officers of doubtful loyalty to the Red cause. Furthermore, Moscow was facing White threats from all points of the compass. The Bolshevik territory thus formed a solid center in a hostile circle, but the Red leaders were firmly united with a single purpose. Deniken, however, was having difficulty in incorporating the Cossacks under his flag.

For many years the Cossacks had received from the czars special privileges which placed their social and economic status well above that of the common peasant. They had, therefore, developed a strong sense of autonomy. This feeling of "separatism" was directly opposed to Deniken's adherence to the idea of "Russia, one and indivisible."

However, on 8 January 1919, an agreement was reached whereby the Don area kept its autonomy and Deniken became

Commander in Chief of the Armed Forces of South Russia. Deniken gives the following estimate of his forces at this time: 5,000 men in Odessa; the Crimean Army—5,000 men; 50,000 troops in the Caucasian and Don Cossack Armies; the North Caucasian Army—10,000 men; and 3,000 men on the Georgian front. The Red armies in Caucasia were divided into two groups which totaled 170,000 men: the Southern Army commanded by General Grittis and the Ukrainian Army under Antonov-Ovseenko. These armies were primarily engaged with the Don Cossack Army.

While this unification of command was taking place in southern Russia, the various armies had been reasonably successful in their campaigns. With the occupation of Vladikavkaz on 8 February, the forces of Deniken cleared northern Caucasia of the Bolsheviks.

Having thus secured northern Caucasia, Deniken called a meeting with his generals early in 1919. In effect, his instructions were that the White rear should first be cleared of all Red bands and then a general offensive was to be launched across the Donets coal basin on the direct route to Moscow. General Wrangel, in command of the Caucasian Army, argued that a union with Admiral Kolchak's left flank would be a much sounder move, but Deniken remained firm. George Stewart in his book, *The White Armies of Russia*, considered this to be "a strategical

also designated Wrangel's Caucasian Army to move eastward and guard the Manych River line.

The long deadlock on the southern front was broken; the offensive launched by Deniken on three sectors almost simultaneously was successful everywhere. The Red units in the area east of the Azov were completely routed. The most notable achievement during these campaigns was the advance of the Caucasian Army. Aided by the brilliant cavalry tactics of General Pokrovsky, Wrangel's army covered 210 miles in 12 days, reaching Kizlyar on the shores of the Caspian Sea.

Thus, the actions on the front which had slowed down during the deep winter months were now actively resumed. During February and March, the Red Army broke through the Crimean front and occupied Melitopol and Berdiansk. Part of the White Crimean forces escaped to the Peninsula of Kerch and other units to the Volunteer Army which was successfully holding the Donets Basin area against a southeastern Red drive. Meanwhile, in the eastern sector, the Don Cossacks had retreated to the Manych River.

The Bolshevik March offensive was split into two principal strikes. The main blow was directed toward the Donets Basin with the aim of reaching Rostov, while the secondary action proceeded against the Caucasian Army. In the Donets area, the attacking armies, numbering some 150,000 troops, were opposed

Mobility, ingenuity, and the ability to strike with lightning speed to the very heart of the country are major principles to be considered by any nation which might, in the future, face the Soviet Union in battle

blunder which was to cost the Commander in Chief dearly."

Although Wrangel's plan appears superior, in view of the subsequent defeat of Kolchak, Deniken is partially justified in his strict adherence to centering the offensive directly toward Moscow. Deniken

by the Volunteer Army under the command of General Mai-Maevsky. By skillful exploitation of the thick network of railroads, Mai-Maevsky moved his troops rapidly from point to point creating the impression of greater forces than he actually had at his disposal.

These tactics were successful in breaking the offensive and the Donets Basin was held intact. Meanwhile, Wrangel's Caucasian Army was slowly withdrawing. The Tenth Red Army was advancing on his right flank from Tsaritsyn. However, the lightning hit-and-run tactics of General Pokrovsky's cavalry halted the enemy forces. As a result of these actions, a brief stalemate existed, during which Deniken regrouped and began to lay plans for the drive to Moscow.

The Tide Turns

While the White armies were slowly advancing in the south, Lenin, in Moscow, was gaining ascendancy in the important political aspect of the war. By granting varying degrees of autonomy to outlying areas, he gained sympathy for the Bolshevik movement. Deniken and Kolchak were not personally adamant reactionaries, but many of their staff officers were staunch czarists. These officers gave the White cause an appearance of wishing to re-establish the old order in its entirety. But political victories were not the only successes being attained in the Red sphere. By trading space for time, the young Soviet Army, at first devoid of discipline and order, was building steadily.

Far to the south, on 11 March, two poorly trained Red regiments captured Kherson from French and Greek intervention forces of superior numbers. The Allies withdrew to Odessa intending to permanently fortify the city, but because of their humiliating experience at Kherson, and the fear of radical propaganda spreading among their troops, they were suddenly ordered to evacuate. By 8 April,

the last ship had sailed from Odessa carrying with it the last hopes of a major interventionist move. The following day, the Red forces numbering less than 2,000 men entered the city.

On 12 April, a serious threat to the White rear occurred when the Tenth Red Army forced the Manych River and drove to within 12 miles of Rostov. Deniken took personal command, and, with the aid of reserves, mended the breach, but was unable to advance further. The front remained static until 9 May, when Wrangel won a decisive victory, aided by a large cavalry unit commanded by the brilliant Moslem leader, General Ulagay. Thus, the attempt to rupture the juncture of the Don Cossacks and the Caucasian Army was repulsed, and Wrangel began his offensive toward Tsaritsyn.

At this point, with the White forces slowed up on all fronts and facing difficulties in Crimea, Wrangel again entreated Deniken to unite with Kolchak who had reached the peak of his advance.

Wishing to command the major offensive, Wrangel disagreed sharply with Mai-Maevsky whom he wished to withdraw in order to provide sufficient troops for the Volga advance. Deniken resolved the controversy by replying, "It is of primary importance to maintain the front. The order to retreat will not be given." He chose instead to commence offensives in the Kharkov, Donets, and Tsaritsyn areas. The advance to Tsaritsyn is one of the most courageous episodes in the history of the war.

Wrangel's Caucasian Army engaged the Tenth Army which had maintained the highest fighting efficiency of all the Red armies. His line of advance lay across the rugged, almost uninhabited Steppes with their marshy rivers, and sharp, rocky ground which unshod his horses and left his men without boots. The fighting was furious and incessant with the Bolsheviks effecting an orderly withdrawal,

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destroying bridges and railroads in the path of their retreat. On 24 May, the Caucasian Army forced the Sal River and by 2 June captured the last serious block before heavily defended Tsaritsyn. Advancing 180 miles farther across the salty steppe-land, Wrangel drew up facing the defenses on the approaches to the city. He repeatedly requested artillery and other equipment to neutralize the enemy installations. After a delay of several days, he attacked without artillery. The army was repulsed with the loss of 5 lieutenant generals, 3 brigadier generals, 11 captains, and hundreds of men. This action was immediately followed by a Red counter-attack which forced him to withdraw from the outskirts of the city.

Wrangel telegraphed Deniken:

It would be criminal not to follow up our success. What we can do cheaply now will cost us huge losses in the future. Courage is not enough. The cavalry can do wonders, but it cannot remove barbed wire. If you do not send us infantry, guns, munitions, and more cars, without which I cannot move around and direct my troops as I should, our success will be but a Pyrrhic victory.

The necessary support equipment eventually arrived, and, after sustaining serious losses, the Caucasian Army entered the town on 30 June. The Tenth Red Army was completely vanquished and Wrangel's cavalry, covered with glory, pursued them up the Volga.

During the period of Wrangel's Tsaritsyn campaign, the White forces were constantly moving northward on the other fronts. The Volunteer Army, commanded by Mai-Maevsky, had scattered the Eighth Red Army and was advancing on Kharkov. The Don Cossacks had defeated the Ninth and Thirteenth Red Armies and cleared the banks of the Don River north-east of Rostov by 4 June. Near the end of June, Cossack cavalry had crossed the im-

portant Balasko-Povorina-Lisky railway link and were bitterly engaged in the Balashov and Voronezh areas. These cavalry squadrons had united with bands of Cossacks which had rebelled behind the Red lines. These uprisings contributed heavily to the demoralization of the Red armies.

Meanwhile, Mai-Maevsky's Volunteer Army had crossed the northern Donets. The Fourteenth Red Army, commanded by Klementiy Efremovich Voroshilov, was rushed from Kharkov in an attempt to bolster the broken Eighth Army line. However, before Voroshilov could organize his forces for an attack, Mai-Maevsky's cavalry—under the command of General Shkuro—pushed them north past Ekaterinoslav which he captured on 30 June. Now protected on his western flank by Shkuro, the First Corps of the Volunteer Army—after a furious 5-day battle—occupied the vital rail center at Kharkov. In the south, the Third Corps of the Volunteer Army had subdued the Crimea by 29 June. The only reversal suffered by the White forces, during this first stage of the campaign, was in the region of Astrakhan. This action was of minor importance and only a small detachment of the Caucasian Army had been released to free this area of Bolshevik bands. The detachment was unable to take Astrakhan itself, but was holding the enemy in check within the city.

In addition to superior cavalry and leaders who possessed more tactical ability, the principal reasons behind the White successes were: the numerical advantage had shifted to give the White armies a slight superiority; the appearance of a few British tanks on the front lowered the Red Army's morale nearly as much as it raised that of the Whites'; the perfidious allegiance of Red partisan bands, particularly that of Makhno, who had recently broken with the Bolsheviks; and perhaps the most important, the Cossack uprisings in the rear.

Superficially, it seemed the Whites soon would be in Moscow, but a few experienced strategists had begun to see the handwriting on the wall.

On 1 July—with the White forces pursuing the defeated Red armies in all sectors—the front line ran through Tsaritsyn-Balashov-Bielgorod-Ekaterinoslav—with all flanks firm on the Volga River in the east and the Dnepr River in the west. Deniken chose this time to reorganize and formally announce his orders for the general offensive “with the final objective of reaching the heart of Russia—Moscow.” Basically, the plan called for the main line of advance to lie in the center sector with flanking offensives to converge on Moscow.

Deniken's strategy may be broken down into four principal parts. The main strike, to be made by the Volunteer Army under the over-all command of Mai-Maevsky, was to proceed directly from Kharkov to Moscow via Kursk, Orel, and Tula with a side action against Kiev. Sidorin, in command of the Don Cossack Army, was directed to move northward via Voronezh. Wrangel's Caucasian Army was to drive up the Volga River to Saratov, then through Nizhniy-Novgorod to Moscow. The remainder of the order called for lesser actions in the Astrakhan and Crimean areas. It may be seen from the map that the three prongs of the offensive were to cover vast amounts of territory. According to Stewart, “this fatal order dispersing the scanty troops of the Commander in Chief into three forces was the prelude to eventual disaster.”

The defeat of Admiral Kolchak was, by this time, obvious to everyone. Consequently, Wrangel had rejected his original plan of joining Kolchak and now offered what was probably the best strategy put forth by the White General Staff. He urged the concentration of all forces in the Kharkov area, holding a large mass of cavalry in the rear as an army of ma-

neuver. This was a sound and militarily feasible plan, but it is doubtful that even it would have been successful, for the political outlook of southern Russia was changing.

Polish Invasion

The invading Polish armies created a military relationship between themselves and the White armies. At the mere suggestion of an alliance with the foreigner, the fierce Russian nationalism was re-kindled. Occasionally now, and more frequently as the feeling against the White cause rose, ex-czarist officers slipped across the lines into the Red camp. As Alexander Barmine put it in his book, *One Who Survived*, “If they were not eager to fight alongside the Bolsheviks, they were at least ready to defend their country, White or Red, against the Poles.”

Kolchak's defeat allowed Trotsky to concentrate large numbers of troops against Wrangel's drive to Saratov. During July, the Caucasian Army and the eastern sector of the Don Cossacks moved northward to the outskirts of Kamyshin. On 1 August, the Red attack struck.

The counteroffensive was divided into two parts. The major attack was directed from Balashov and Kamyshin against Wrangel's forces advancing to Saratov, with a somewhat lesser attempt proceeding from Kursk and Voronezh toward Kharkov. The Caucasian Army withdrew slowly, extracting heavy tolls from the veteran Tenth and Eleventh Red Armies. On 22 August, with their backs against the walls of Tsaritsyn, the Caucasian Army was attacked from the south by Red units which had broken through from Astrakhan. However, by 24 August, Wrangel, with a spectacular display of cavalry tactics, had decisively defeated the encircling Red armies.

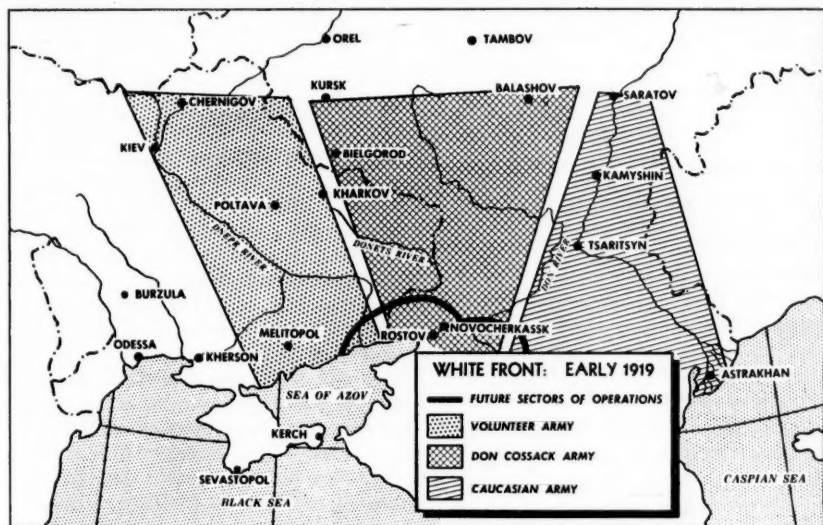
Although the Bolshevik attack was halted, the Caucasian Army had suffered tremendous losses, and was to remain on

the defensive until October when they made a short advance northward. Despite the static nature of the front, the fighting was heavy and incessant and the hope of reaching Saratov was gone forever.

Meanwhile, the Don Cossacks had been thrown back at the outset of the Red offensive. The Bolsheviks advanced into the Don territory, but the skillful handling of better-trained cavalry and the resolution of the Cossacks in defending their

He broke the Red lines east of Povorino on 10 August and, striking directly north, he captured Tambov on 18 August. Holding the town for 3 days, he then moved westward burning, pillaging, and destroying Red communications and supply depots. He recrossed the lines and joined Shkuro's forces on 19 September.

The reason for his almost unbelievable success was the result of his shrewdness in destroying every railroad he encoun-



homes turned the tide in favor of the Whites. Near the end of August they had again emerged on the Povorino-Tsaritsyn railroad.

The Bolshevik offensive threatened Maievsky's Volunteer Army by striking southeast of these towns. A flanking movement of Shkuro's cavalry, directed almost due east, broke behind the Red lines and forced them to retreat. Thus, the August offensive had been either repulsed or stopped on all fronts.

Another factor contributing to the defeat of this offensive was the famous Cossack cavalry raid led by General Mamontov.

tered, and thus preventing the movement of the Red Army in pursuit of him. Had he engaged General Budenny's excellent cavalry, he would probably have been defeated, but, fortunately, Budenny had been diverted by Cossack uprisings in the rear of the Red lines.

The tactical success of the raid is unquestionable, but its strategic value is open to serious doubt. It caused Trotsky to realize the pre-eminence of the threat in the south. Consequently, he began to withdraw units from other fronts and deploy them against Deniken.

While Mamontov was carrying out his raid, the Volunteer and Don Cossack Armies were rapidly advancing in the wake of the defeated Red offensive. Far to the south, Kherson and Odessa had been captured on 18 and 23 August. By 31 August, Kiev had fallen to General Bredov on the western flank. In the north, Kursk fell to the Volunteer Army on 20 September, and Shkuro's cavalry occupied Voronezh on 30 September. The Don Cossack Army had been victorious in the taking of Lisky, but had halted their advance in order to take the captured war booty south to their homes. Mamontov gave his tacit approval to such actions by taking a rest leave in Rostov.

Such action was only a small indication of the growing decadence of the White armies. Everywhere behind the front lines pillaging, graft, and drunken debauchery marked the downfall of discipline and order. By this time, a shift in fighting efficiency had taken place; the Red armies had become the better disciplined force. However, they were not yet ready for another major counteroffensive.

The White advance continued during the month of October. Orel was captured, and by the end of the month, the front lay slightly north of the line Astrakhan—Tsaritsyn—Orel—Chernigov—Kiev—Odessa. Only Tula—an important munitions center—lay between the White cavalry and Moscow, 200 miles north. Many White commanders expected to hear the Kremlin bells within a few days. The capture of Orel marked the high tide of the armed forces of the south. They occupied 400,000 square miles inhabited by 5 million peasants. To control this vast amount of territory, Deniken had 150,000 troops at his disposal. His lines were stretched to the breaking point. According to Stewart:

The front had no stability. It had become a series of patrols with occasional

columns of slowly advancing troops. Exhausted men found themselves in the midst of a population growing less friendly as the gathering Red counterattack became imminent.

In fact, the population was growing openly hostile in the face of the Polish invasion and the mass requisitions imposed upon the people for the support of the White armies. Lenin's statement that, "He that is not against us is on our side," was working in his favor. Deniken was forced to divert front-line units to combat internal uprisings. On one occasion, his headquarters at Taganrog was nearly overrun by Makhno's band.

Despite Deniken's lack of depth, his proximity to Moscow, and the presence of General Yudenitch's White armies of the west at the gates of Petrograd, presented the Soviet regime with a serious threat. Lenin spoke in Red Square, "... the Soviet Republic's very existence (is) threatened by the armies of Deniken." *Pravda* stated on 14 October, "Now even the blind can see the decisive days of the Revolution have come. . . the fate of the whole movement is now being decided on the Southern front."

Beginning of the End

In early November, Deniken's armies occupied the entire Ukraine—the front lines stretching in a wide arc from Tsaritsyn through Orel to Kiev. This was the climax—the Reds started an energetic counterattack which eventually ended in complete victory.

The long line, reaching from Romania to the Volga River across 1,000 miles of Russian fields, was thinly held. In addition to quelling uprisings in the rear, the capture of Orel had been effected only by shifting much-needed units from the fronts. There were no uncommitted reserves. Even if there had been an opportunity to regroup and concentrate—ac-

tually it was far too late—it would not have been psychologically possible. Deniken realized that with the growing unrest of the populace and the low morale of his troops, any slowup on the front would be fatal.

The collapse came with almost inconceivable rapidity. The Red offensive was again divided into the two main attacks—one to strike directly at Orel; the other at Voronezh in an attempt to break the line joining the Volunteer and Don Cossack Armies. It was hoped that the latter move would prove not only a military victory, but would also politically alienate the Cossacks. At the outset of the counteroffensive, there was furious fighting near Orel by the loyal ex-czarist officer battalions, who made it a point of honor to fight until death. To the east, Budenny had decisively defeated the Don Cossacks on the Voronezh-Lisky line, putting their entire sector to flight. The right flank of the Volunteer Army was thus enveloped causing the hurried evacuation of the Kursk area. After the fall of Kursk, the White armies were completely scattered before the onrushing Reds. Bands of peasants sprang up everywhere harassing the retreating Whites and making any attempt at consolidation impossible.

By 31 December, in an unbroken sweep, the Red armies had occupied the entirety of the Donets Basin and on 8 January, captured Rostov. The White defeat was nearly complete.

Earlier, Wrangel had been transferred from the Caucasian Army and given command of the Volunteer Army in a vain attempt to reorganize the White forces. On 4 April, with the remnants of the White armies in Crimea, he succeeded General Deniken as Commander in Chief. Under the protection of British naval guns, he held until all that remained was for the Allied fleets to carry those who did

not accept it (Red peace proposal) into exile and poverty.

Deniken's Failure

General Deniken's failure followed classical lines. Although Russian himself, by sharing a common goal with the Polish invader, he crossed swords with the same Russian nationalism that Napoleon encountered over a century before. His men and officers joined the Soviet ranks, not because of sympathy with the Bolshevik movement, but because of their inherent hatred of a foreign transgressor. Similarly, this same hatred and the fear of reaction were the principal reasons for the peasant uprisings in the rear of the White lines.

The Bolshevik leaders followed almost exactly the principles of mobile depth defense laid down by Clausewitz. Alternately counterattacking and withdrawing, they traded territory for time as they forged their newly-formed armies into effective fighting units. The Soviets operated on interior lines, strengthening their lines at the weakest point while their adversaries, Kolchak in the east, Deniken in the south, Yudenitch in the west, and Miller in the north, were separated by wide stretches of land and sea, and were unable to co-ordinate their military effort.

The Future

Any future nation at war with the Soviet Union must profit by mistakes of the past. That vast and somewhat inchoate empire has powers of resistance which have always disintegrated the invader. The future invader must be prepared to cope with the tremendous logistical problems encountered in such expansive territory. He must effectively control the conquered land and protect his rear with ample reserves. Above all, he must strike with lightning speed to the very heart of the Soviet Union.

THE LOGISTICS OF NATHAN BEDFORD FORREST

Jac Weller

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The views expressed in this article are the author's and are not necessarily those of the Department of the Army or the Command and General Staff College.—The Editor.

THERE were 32 Confederate lieutenant generals and full generals. Of these, 29 were graduates of West Point. The other three had diverse educations and backgrounds. Richard Taylor, son of General and President Zachary Taylor, was a man with academic training and military background. Wade Hampton, the South Carolina seigneur, was bred to power and command. The last, Bedford Forrest, had 3 months' schooling in his life. Forrest's rise, in a time and place where birth and background were usually necessary, was indeed remarkable. Much that he did is unusual; the man himself is unique.

Many think of Forrest as one of a small group of first-rate Confederate cavalry raiders. They recall his own personal physical prowess. Others, of a more technical training, think of him as the Confederate commander who, somewhat unaccountably, was studied carefully by professional soldiers from abroad in relation to his tactical use of dismounted men. All these statements are true. Forrest's raids were larger in extent than those of Stuart, uniformly more successful than

Morgan's, and more numerous than those of Wheeler and Van Dorn. Thirty men fell by his personal weapons in hand-to-hand combat during the war—no other modern commander approaches this figure. The British Field Marshals, Viscount Wolseley and Sir Douglas Haig, wrote and thought much about Forrest. The rather unimaginative following of Forrest's methods by the Imperial Russian General Staff in 1914 may have contributed to their defeat.

There is another side to Forrest. He accomplished a lot for the Confederacy. His invasion of middle Tennessee in the summer of 1862 made possible Bragg's Kentucky campaign. His west Tennessee invasion in December of the same year aided in defeating Grant's second campaign against Vicksburg. Forrest's record in 1863—whether operating as a part of a larger command as at Chickamauga, or independently as in pursuit of Streight's raiders, and in west Tennessee and Kentucky—was brilliant. The full size battle of Brice's Crossroads was only one of several independent successes in Mississippi and west Tennessee in 1864. He saved what was left of Hood's army after the defeat and rout at Nashville in December of that year. Even in 1865, his defeat was less decisive than that of others.

These accomplishments are great. Personal leadership in battle and even the combination of many correct battlefield decisions cannot alone account for them. Behind the colorful personality of the man

who "fought by ear," as he called it, there was a basic soundness of organization and supply of a very high order. Forrest was by nature and experience a weapons man of great capacity. But in the western Confederacy he not only had to organize his weapons team with little or no help from established procedures, but also provide the arms and keep them supplied with ammunition. He frequently had to feed, clothe, and mount his commands in much the same way. We find here not only the explanations of Forrest's accomplishments, but also much of intrinsic value in organization and supply. In order to understand the soldier, one must first know the man.

Forrest did not become a soldier until a few days before he was 40. He enlisted as a private on 14 June 1861, in what became the 7th Tennessee Cavalry. It would be a mistake to believe that his greatness began then. Perhaps few men entering an army at any time have taken so much with them in the form of experience and know-how from civilian life. His first 40 years are particularly important for what was to follow.

Nathan Bedford Forrest was born in Bedford County in middle Tennessee in 1821. His hardy family lived in a tiny cabin. The elder Forrest was a blacksmith and small farmer. They were sound frontier Anglo-Saxon stock, not in any way connected with the slave-holding aristocracy of the South at that time. Bedford's

tlement. This country was virgin wilderness. Bedford's mother was attacked by a panther a few steps from their home. Murder of entire families by Indians, or even more savage white renegades, was common. Schools were unknown. When Forrest was 16, his father died, leaving him the head of the family. By thrift and hard work, in a surprisingly short time, he made them comparatively affluent.

Bedford, even before his majority, went into partnership with an uncle and started trading in horses. As a young man, he was interested in any and all money-making operations. He bought and sold, as his capital increased, both slaves and real estate. He prospered and his field of operations increased. In his middle twenties he moved to Memphis. This was a time of great over-all prosperity along the Mississippi, but Bedford Forrest in the 1850s did far better than most.

He quit the slave trade before the war, and confined his activities almost completely to raising cotton on his several plantations. In 1860, he made a thousand bales which, with the natural increase in his own slaves, probably meant a net income to him of about 75,000 dollars in the money of the day. He was worth at this time about 1,500,000 dollars. The figures alone do not give a full picture. On the basis of relative purchasing power after taxes, probably no citizen, during the year 1952, topped Bedford Forrest in 1860.

General Nathan Bedford Forrest is remembered usually as a colorful leader who had the ability to make the right decisions on the battlefield. He also may be remembered as an organizer and logistician without peer

grandfather, who was perhaps a soldier of the Revolution, was born in Virginia but lived most of his long life in North Carolina. The Forrest family—Bedford was the oldest of nine children—moved from Tennessee to North Mississippi as soon as the Indian lands there were open for set-

Although Forrest enlisted as a private soldier along with his own son and his youngest brother, whom he had raised as a son, this was perhaps something of a gesture. Forrest was well known along the Mississippi. Wealth and position were important in the Old South. He was a natural

leader, as well, and had been an alderman of Memphis. He had a reputation for fearless and furious action. Forrest had once taken from a mob of 2,000 men, a prisoner whom they were going to hang without trial. He completely overawed and dispersed the entire mob with two Colt Navy revolvers and a Bowie knife. A man like this could not be wasted in the ranks. He was commissioned within a few days by the Governor of Tennessee as a lieutenant colonel and ordered to raise his own battalion.

Forrest's contributions to organization and supply began with the raising of this battalion. His civil life skill and experience, however, made for a smoothness and unity of effort that make a separation of those two qualities difficult. Forrest, with vast ability and almost no formal education, neither knew nor cared about Army regulations. Nevertheless, he clearly understood the basic problems. If men were to function as a group, they had to be organized. If they were to fight, they had to be armed. If they were to continue to function as soldiers, they had to be subsisted.

Personal Attributes

In Tennessee, in 1861, the first problem of organization was recruiting. Forrest had a flair for simple oratory; he had a reputation; he had money. He used all three, along with great common sense, to fill up his battalion at a time when many

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others failed. Again and again during the war, he was to prove himself almost without a peer at raising troops.

His ability to attract volunteers did not mean that Forrest was lax. He realized always the importance of discipline to organization. He was tough. He personally threshed dozens of his troopers for infractions of various rules, disobedience to orders, and even bringing him false information. It was claimed that he could beat in unarmed physical combat any man who served with or against him, even though Forrest was over 40 when he first commanded Confederate soldiers. In emergencies, he shot down his own men without mercy to stop panic. At Brentwood, in the spring of 1863, he discharged someone's buckshot-loaded double-barreled shotgun into a Confederate squad momentarily fleeing. He killed for cowardice the color bearer of an infantry regiment serving under him at Murfreesboro in December 1864.

Fear has a place in all disciplinary programs. In Forrest's commands it was in part, at least, a personal fear of the commander, yet it brought the men together. He was undisputed champion, physically, during the war years. He remained so in the hearts of his soldiers as long as they lived—the one and only champion of their youth. They remembered many of his characteristics when they talked about him in later years, one this and one that. The universal features, however, of all word pictures were the enormous, powerful shoulders and the furious bronze-colored face when he was fighting mad.

Fear alone may produce discipline. Forrest inspired more than that. He swore and killed, yet no filth ever passed his lips. He was as strong morally as he was physically. He neither drank nor used tobacco in any form. Even during the war years his men loved him in a way second only to the Confederate deifying of General Lee. His men began to realize, also, his own great love for them. Bedford For-

rest had an approach to the Civil War far different from that of the planter aristocracy. His South was one great clan. Men from all walks of life realized it. He engendered, throughout every body of troops that he commanded for any length of time, a kind of family unity. He was hard, yet he cried like a baby when they buried Captain Freeman, his first Chief of Artillery. They realized after a few engagements that Bedford Forrest did not lose his judgment when the battle-rage came upon him. As a matter of fact, there is an undercurrent of feeling, half expressed, that these rages were to some extent intentional. They certainly inspired his own men to do their best. He was still capable of making the most astute decisions and changes of plan in the very middle of them.

A Good Administrator

Along with his personal leadership, there was also the interest of a chief of a clan in the material well-being of each soldier. From the very beginning, he took more than ordinary care of the subsistence and happiness of his command. He was a good administrator. Throughout the war, Forrest's commands showed a higher percentage of personnel present and ready for duty than other comparable units. At first, when he was still receiving issues from the Confederate government, he was good at getting what he ordered, when every other battalion commander was compelled to wait weeks. He soon found that the running of a command was not greatly different from the running of several plantations. Slave labor required about the same form of quartermaster and commissary work as troops in the field.

A subsistence organization that depended solely upon the official Confederate channels would have failed, particularly in the west. Early in the war, Forrest began to gather a group of men capable of finding what was required for his men through both regular and irregular chan-

nels. These officers were Forrest's business associates from civilian life. He took them virtually intact from command to command throughout the war years. His commissary was in charge of Major Gilbert V. Rambaut, a former Memphis hotel manager. His quartermaster had long experience in merchandising in this area. The rest of his staff were not only experienced, but particularly capable in civilian life in the same kind of work that he had them doing in war. Forrest was a keen judge of men and had a capacity for employing this personnel where their talents would be most useful in taking care of his command.

Forrest was shifted four distinct times during the 4 years, because of the personal enmity between him and his Commander, Braxton Bragg. His undoubted ability at raising troops may have been a factor also. He raised a battalion that became a regiment. It was taken from him, and he was personally assigned to organize and equip a brigade, in the summer of 1862, from raw troops and new volunteers. Half a year later, he found himself doing the same thing in middle Tennessee. Finally, he raised a third brigade in west Tennessee and Kentucky in December 1863. Through all these changes he managed to carry with him a good many of his staff and key personnel. More important still, there was, somehow, a continuity of feeling.

Mutual Confidence

On occasion, Forrest demanded the last ounce of energy from man and beast, as in the pursuit of Streight's raiders. He whipped and captured the picked Union command of about 1,700 with 600 of his own, because he somehow kept his men and horses in better physical shape. He trusted his men. He built up within them the feeling that they could not let him or themselves down. Forrest fearlessly gave furloughs to entire regiments, even in the last winter of the war, confident that every

single man would return. He was disappointed in few instances, although other commands, even General Lee's Army, was disintegrating through desertion.

This mutual confidence was based on mutual obligations. In covering the retreat of the Southern Army after Shiloh, Forrest was wounded by a *Minié* bullet which lodged near his spine. He went back to Memphis with a 4-weeks' leave; but the health and spirit of his regiment suffered so much at Corinth because of poor living conditions that he returned in less than half the time to take command and bring order out of chaos. A few days later, the bullet was started from its position in a skirmish and had to be cut out without anesthetic. This time he continued in command.

Esprit de Corps

A knowledge of past success and pride of accomplishment is always a powerful aid in building esprit de corps. With Forrest's commands this went even further. They were famous men in an army which was particularly hard on the ego of others. The Confederate infantrymen, partly through jealousy, jeered at cavalry because of their supposedly easier life and relative freedom from bloody combat. Even fairly early in the war, the Confederate armies of the west had these jibes in plenty for all cavalry commands save Forrest's. For his men there was praise even to their faces. The accomplishments of Forrest's men were known throughout the western armies, both Union and Confederate, long before they had penetrated into the higher circles at Richmond. The dauntless courage with which his men occasionally could fight—shoulder-to-shoulder with infantry for hours on end and then mount their horses at dark, to continue pursuit throughout the night—endeared them to the infantry.

Nothing was more important to the spirit of Forrest's troops, nor to their con-

fidence in him, than the very real concern he showed for their lives. In spite of his fighting ability and his many adjurations of getting in the first blow—"getting a bulge" on the enemy and "keeping the scare on them," as he called it, with continuous attacks—Forrest was not a reckless commander. His men knew it. His famous "hit 'em on the end" remark—attack from the flank and rear—was part of Forrest's general economy of the lives of his men. He was most emphatically against the frontal attack that Hood made at Franklin, and against Wheeler's efforts to storm Fort Donelson. For him, and because of him, men accomplished tasks requiring epic physical endurance. Yet he realized what men could not do. He also realized that some victories were not worth while, even if they could be achieved, if the cost in lives were too great.

Few men who ever fought have been such a master of bluff as Forrest. On literally dozens of occasions, he caused Union garrisons, and even small armies in the field, to surrender to his great superiority in men and guns—to stop the further effusion of blood as he phrased it—when in actuality Forrest had only a small fraction of the force he claimed. Perhaps Forrest did not defend himself more volubly against the palpably unfair atrocity stories arising out of the capture of Fort Pillow, in order not to hurt this first-rate publicity for the future surrender of enemy garrisons to him. A Congressional committee—they had them then, too—gathered volumes of testimony of the most obviously unreliable type, tending to show that when the Fort Pillow garrison refused to surrender on demand, he then took the place and put some of them to a horrible death. None of the high Union commanders took much stock in the committee's findings, but apparently some of the garrison forces and their commanders did. Forrest's demands for surrender in the future received careful consideration.

He took some block houses without firing a shot, although these had ample capacity to resist successfully, as well as many others whose resistance, although probably in the end unsuccessful, would have been costly in time and lives. By every means possible, Forrest conserved the lives of his men. That was why they trusted him so completely.

Intelligence

Perhaps no part of Forrest's organization is quite so characteristic of him as his use of scouts. Information is of tremendous importance in war. Forrest intuitively appreciated this from the very beginning; in his own unique way he organized the gathering of information extremely well. Trained regular soldiers are notoriously poor at mingling with civilians to gain information. Even volunteer soldiers in uniform are somewhat at a disadvantage. Forrest's scouts, who were more or less continuously commanded throughout his various organizations by his brother, Captain Bill Forrest, were never on the Confederate payroll. They came together in times of stress and fought bravely, mounted or on foot; however, they usually operated semi-independently. They were not spies; they were always armed and operated under direct control against the enemy. There was an informality about the Southern uniform, however, which allowed the scouts to appear to be civilians when it was desirable. Forrest was undoubtedly the best informed commander on either side.

Forrest's Escort Company

Another somewhat similar organization uniquely used by Forrest was his escort company. This was composed of soldiers individually selected for their fighting ability. Early in the war, Forrest needed a small force that he could personally lead into combat at a critical time or send on the most difficult type of flanking missions. He formed this group, as much as possible,

with men like himself. The company grew in size from about a dozen in the old battalion days to as many as 200 late in the war. They were first-rate at fighting or at maneuvers; they could bluff; they could even, on occasion, do an extremely convincing job of deserting to the enemy with complete information as to Forrest's plans—all, of course, in accordance with his instructions.

Too much has been written of the lack of drill in Forrest's commands. Early in the war he knew little of the proper orders for close maneuvers and did not realize their value. He was a natural fighter. He learned about drill somewhat slowly, but when finally convinced of its value, he characteristically did more of it than other commands. In middle Tennessee, in the spring of 1863, he had dress parade twice a week.

The Master's Footstep

All things human are subject to error. Forrest's organization was first-class. He had learned with his plantations that no fertilizer is so productive as the master's footsteps. He personally checked on the entire command. Even when he had divisions, he would occasionally inspect every man, animal, weapon, and vehicle. He could and did delegate authority. His powerful mind was never overloaded with detail. But he realized that events went better when there was an "on your toes" feeling engendered by knowing that the big boss may come around almost any time.

He had the best scouts in the country, yet he made, when possible, a personal reconnaissance of every position he attacked. At Donelson, Forrest rightly refused to believe a report of reputable scouts because it was not logical. He saved his command thereby while most of the remainder of the Confederate force was surrendered.

Supply was the basic problem of the Confederacy. Before the final defeat, Confederate armies were forced into inef-

fectiveness by starvation and exposure. One of the tragedies of the Confederacy is the fact that this took place in some parts of the South, whereas there was plenty of food, clothing, and tentage in other sections. Supplying weapons to troops was, at the beginning, even more serious, although the problem eased later with captures and importations from Europe. Transportation was then, as it is today, the most important corollary of supply. Forrest's innate ability along these lines is astonishing. His methods of attacking the problem were characteristic of him. When almost every other commander in the Confederate Army, including even General Lee, was protesting against the failure of commissary and quartermaster supplies to arrive, and actually doing little about it personally, Forrest took matters into his own hands. He did not stop trying to get supplies through the usual channels, if possible; however, he took steps independently, also, with his own organization intimately acquainted with the mercantile and agricultural situation in the deep South. These men found for Forrest's soldiers, and delivered to them all that the country had. The rest had to come from the occupied territory or the enemy.

Personal Funds

Early in the war, Forrest's battalion had a compact, well-provisioned wagon train driven by his own slaves. In large measure, the wagons and teams, as well as the supplies that they carried, were furnished by Forrest himself. His teamsters were promised their freedom at the end of the war and served him faithfully long after they could easily have deserted to the enemy. His opponents had trouble understanding Forrest's personal popularity with the Negroes even after the end of the war. Forty-four of the original forty-five teamsters remained into the last year of the war, but the attrition in mules and wagons was great.

Forrest's first recourse in supplying weapons to his men was to purchase them with his own funds. He procured 500 Colt Navy revolvers in this manner in the summer of 1861, in Kentucky. He bought new shotguns and had them cut down according to his ideas for use by his soldiers. Volunteers were urged to bring their own arms. Forrest's staff made sure that they received their full share of the weapons provided by the government. Most important of all were the captures from Federal troops in action.

Forrest appreciated more than most military men the power of money in getting supplies and even equipment through civilian sources. He spent his own without hesitancy. In west Tennessee, in December 1863, he spent 20,000 dollars of his private funds within a few days on subsistence for his men. This was in the times when an industrial worker was making but 5 dollars a week. In 1863, he advocated bringing into west Tennessee and Kentucky cotton with which he could have purchased not only subsistence supplies but ammunition and even small arms. Cotton was as valuable as gold in the North and in Europe. Only a small fraction of the accumulated Confederate cotton was ever sold. A realist always, and close to his people, in the last winter of the war he wanted salt to exchange for foodstuffs with the civilian population, now almost as hard pressed as the Army. Confederate paper money did them no good.

Union Supplies

In Bedford Forrest's invasions, he gathered up everything—not only arms, clothing, and foodstuffs, but lead and leather as well. Toward the end, when the Confederacy lacked even horseshoes, he brought out the iron rims from farm-wagon wheels in order to beat them into the needed shoes for his horses. With characteristic thoroughness, but with due regard to the rights of private property,

Forrest's organization would secure all that they could from civilian sources behind the enemy's lines. However, the truly great supplier was the Union Government. Viscount Wolseley writes of Forrest's forces in 1864, as having, "every gun, rifle, wagon and ambulance and all the clothing, equipment, ammunition and other supplies . . . taken from the Northern armies" with most of it so stamped. Some articles issued by the Confederacy were of such poor quality as to be positively harmful, such as saddles. These hurt Forrest's command less than others, since he had very few of them.

Paper Work

Forrest had a peculiarly civilian approach to all property that he took from the enemy. At Murfreesboro, with his first brigade in their first real capture, he started his practice of inventorying everything. He had a peculiar knack for the right kind of paper work. His accounts were remarkable, as were the reports that he made, in spite of his well-known shortcomings in regard to written and spoken English. He had lived in poverty in his youth; he treated all the items that he captured as carefully as he did his own. Only by the most painstaking care could property be efficiently kept, either on a slave-run plantation or in the Army.

Forrest's attention was particularly directed to the horses upon which his command depended. There is nothing so important to cavalry as the condition of their mounts. He spent hours in inspections and in the training of the men to care for their animals. His ability to get a little more from his command in a crisis than the opposing generals could get from theirs was fully as much because of the painstaking care that was spent on the animals as on the men themselves. Forrest had known horses all his life and loved them. He believed in their practical use, however; 29 horses were killed under

him during the 4 years of the war by enemy action.

Engineering

Forrest fought over a territory largely without public means of transportation. What bridges there were before the war were soon destroyed by one or the other of the contending armies. The ability of his command to ford streams is truly remarkable. In the early stages of the Chickamauga campaign, he offered to carry three infantry divisions across the Tennessee on the backs of his horses. The fording of a river as wide as the Tennessee—more than a mile at one place that Forrest crossed—seems inconceivable, yet he did it reasonably often at low water. With the rains, however, even the small streams became impassable to ordinary cavalry. Forrest developed an unusual ability to get his entire command across, including artillery, by swimming the horses with their riders and then pulling the guns across by means of a rope attached to a double team on the other side. The gun itself would be completely under water but was not permanently harmed. The ammunition was held above water by the men or taken across in small boats.

Twice on the way to Memphis, in 1864, when General Smith's invasion of Mississippi was defeated by attacking his own base, Forrest built bridges over large streams by using wild grapevines and trees felled in midstream. These bridges depended, in part, on floats in the middle and would, perhaps, only survive a day or so; however, they could be built in a matter of 3 hours, including rail-and-board flooring, and allowed the passage not only of men and animals, but also field guns and caissons. When Forrest had to cross the Tennessee, in December 1863, he sent ahead a boat-building party and, after he was across, sank the two flat boats in order to use them on his return.

First Mule Train

Another unusual transportation expedient used by Forrest (and probably invented by him) was the replacement of some of the railroads in north Mississippi, at least to an extent capable of transporting supplies by having freight cars pulled by teams of mules rather than locomotives. Forrest was a master of improvisation throughout his career. He once saved a gun during a temporary retreat at Chickamauga by quickly putting it over the saddles of the horses of four of his escort. When continuous weeks of rain rendered the roads completely impassable to horse-drawn artillery of the ordinary kind, Forrest took his guns to Johnsonville by impressing large teams of oxen along the road.

Hood's Retreat

Perhaps the most astonishing transportation achievement during the entire war was the retreat of Hood's defeated army after Nashville. Forrest was not present at the battle, which was undoubtedly the worst defeat of any suffered by a Confederate army in the field. More than 13,000 men and 58 guns were lost; it was really a rout. Yet, when Forrest arrived across country from Murfreesboro, he brought order out of chaos. Nominally in charge of the rear guard only, he not only fought continuously his own entire command and an accompanying infantry division, but also managed to get every gun and wagon across the Tennessee in extreme winter weather. Rather than struggle against the hub-deep mud and ice for miles with regular teams, Forrest left half the guns and wagons and double-teamed the others across the Tennessee. He held up the Union pursuit under Wilson long enough to bring back the animals and make another trip. During this retreat, he not only moved out every gun and wagon that remained, but also a large number of beef cattle and

hogs under their own power that he had gathered independently at Murfreesboro. Anyone doubting Forrest's ability to handle a larger operation need only read again the saga of this retreat. He was advising Hood, not only on the rear guard action and the trains, but also on every other detail of army operation. His was a truly remarkable performance.

Beginning of the End

Time was running out, however. Before the last of Forrest's cavalry was south of the Tennessee, 1865 had dawned. The Confederacy was slowly sinking from attrition as well as the blows of the Union armies. Even in the early spring, Forrest's command continued in reasonably good shape. Once more regiments bravely prepared for a campaign. Somehow he managed to feed, clothe, and arm his men a bit better than other units. Even the horses had come through the winter sounder.

But Forrest and his men lost a battle at Selma to the superbly subsisted and equipped troopers in blue under the Western cavalry commander, General James H. Wilson. Although they escaped with relatively little damage, they were crushed by wild rumors of tragedy in Virginia—of General Lee's surrender at Appomattox. Like the great Virginian, Forrest also surrendered with his men, although he could have escaped to Mexico.

Nathan Bedford Forrest commanded one of the last organized Confederate forces of any appreciable size to surrender. He may be said to have been the last leader of the Old South. He was also probably the first leader of the New South—the head of the Ku Klux Klan when it was the last resort of the decent elements of a defeated people. This man may have lacked polish and education, but as a fighter—and as an organizer and supplier of fighters—he had no peer.

MILITARY NOTES

AROUND THE WORLD

UNITED STATES

Food Project

Various agencies, both civilian and government, will join the Army in a 5-year research project to develop a method of preserving foods safely with atomic radiation. The Army reported that if the project proved successful, it would revolutionize food packaging and processing, reduce refrigeration, increase the "storage life" of foods, and lessen the burdens of food storage and transportation.—News release.

Titanium Alloy

A new lightweight titanium alloy, said to possess the toughness of high-strength steel, has been developed by Army researchers. Laboratory tests have shown the alloy to be 40 percent lighter in weight than high-strength steel. It is highly corrosion-resistant and possesses properties that compare favorably with those of steel used in making heavy weapons, tanks, and armor plate. It shows a tensile strength up to 192,000 pounds for each square inch, or 42,000 pounds a square inch stronger than any present titanium alloy. The new alloy is tougher and more pliable, permitting it to be shaped, thus overcoming the brittleness factor that limits the use of present alloys according to the report.—News release.

Aerial Tanker

The country's first jet transport, the *Stratotanker* (MILITARY REVIEW, p 64, Jun 1954), is shown, foreground, parked alongside the present Air Force tanker-transport, the KC-97G *Stratofreighter*. The



Present and future air tankers compared.

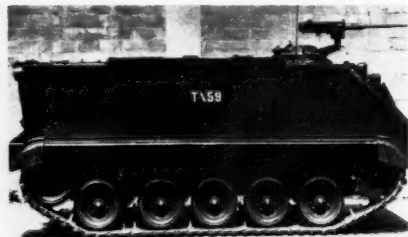
new prototype will cruise at 550 miles an hour, and is designed for efficient aerial refueling of jet bombers, fighters, and reconnaissance planes. The *Stratofreighter* cruises at more than 300 miles an hour and is a piston-engine plane. The *Stratotanker* is powered by four JT3-L turbojet engines, each developing more than 10,000 pounds of thrust.—News release.

Skyscrapers Only

Because of the limited space where the mountains come down to the shore, Whittier, the southern port of the Alaska Railroad, is destined to become virtually a 2-building town. Plans for a new 14-story apartment building for military personnel and their families have recently been announced by the Army. The town is already the site of a fabulous military structure known as "a town under one roof," which houses all the tenants' service and entertainment facilities, along with bachelor living quarters. There are only about 100 acres of level land available at the site of this military shipping terminal. The new building will have 177 apartments of one, two, and three rooms for servicemen and their families and quarters for 39 civilian bachelors.—News release.

Personnel Carrier

The new armored personnel carrier, *M-59*, has undergone troop tests by units of the 1st Armored Division at Fort Hood, Texas. This new personnel carrier has a lower silhouette than previous models and



New armored personnel carrier is tested.

it is easier to service and keep rolling. Its engine is many times quieter than other models, also. Many of the parts of the *M-59* are interchangeable with parts of other military vehicles. As it is amphibious, it can be used to cross relatively calm streams without adding additional equipment.—News release.

Close Stoneman

The cessation of hostilities in Korea has decreased the Army's flow of replacements to the Far East and, as a result, Camp Stoneman, Pittsburg, California, will be inactivated by 31 August 1954, and placed in a standby status. Processing of all personnel now being assigned to the Far East will be accomplished at Fort Lewis, Washington, and at Fort Ord and Oakland Army Base, both in California. All three of these posts are permanent installations.—News release.

Reserve Training

To train the Army Reserve in the latest tactical methods and employment of much of the Army's advanced new equipment, approximately 130,000 men from about 5,000 units will undergo 2 weeks of training before the end of summer. Reserve unit personnel, assisted by regularly assigned unit advisors, will direct actual training activities. Reserve Mobile Instructional and Demonstration teams from the various Army areas, used in Reserve training during the fall and winter months, will also be used in the training which will be conducted, largely, at platoon and company level.—News release.

National Guard Helicopters

Army units of the National Guard that are authorized aviation are receiving their helicopters. According to the report, units located in the First, Second, and Third Army areas are receiving *H-13* helicopters, while units of the other three Army areas are getting the *H-23* model. These planes are used for training in photography, ambulance service, and other missions, and will be available for local emergency use. This has created a vacancy in National Guard units for approximately 700 Army aviators or Army aviator trainees. Other aircraft used by the National Guard are the *L-19*, *L-20*, and the *L-23*.—News release.

Field Training

An estimated 290,000 National Guardsmen in more than 5,000 Federally recognized Army units in this country and in Puerto Rico, Hawaii, and Alaska will take part in intensive 2-week field exercises at State and Federal camps this summer and fall. The primary field training objectives will be small unit training, service practice firing, and the development of leadership in noncommissioned officers and small unit commanders, with secondary missions of recruit and individual specialist training, and weapons firing which could not be completed during the armory training period. The majority of the 26 National Guard divisions will train as complete units, even when drawn from two or more states. Approximately 50,000 vehicles, including trucks, buses, trains, and planes will be employed in the field training movement. The training will be conducted by State as well as unit personnel assisted by active Army advisors on duty with these units.—News release.

Recovering Uranium

An improved flotation process that captures radioactive uranium in froth and carries it to the top of a vat is seen as an easier way of recovering the atom bomb material from ores and "artificial ores." These "artificial ores" are earth materials which contain the uranium element. Previously developed flotation methods can rarely extract all the uranium economically, and separating the element from the froth is tedious, difficult, and expensive. The new process consists of crushing the uranium-containing ore into fine particles, mixing them with water, adding a polyethylene oxide-phenol detergent and a sodium salt of at least one fatty acid. The mass is then agitated so that froth is formed. This froth carries the uranium to the surface and it is easily recovered when the froth is sprayed with water.—News release.

Train Reserve Nurses

When nurses of the Air Force Reserve train with hospital units of the Air National Guard this summer, it will mark the first peacetime service for women in the Guard.—News release.

Two-Company Barracks

A new design for permanent type barracks, a 2-company type, has been approved by the Army. These buildings will replace the present 1-company, or 225-man barracks, and will probably be built at those posts which need quarters for more than 300 men. The Army expects to build them at the same cost, or less than the \$1,700 per man for the present type. The new barracks will have asphalt tile floors instead of concrete, and tile wainscoting in place of painted concrete. The 3-story buildings of reinforced concrete will be in the shape of an E, with the end wings extending on both sides of the center. Company integrity will be maintained despite two companies being housed in one building.

Storage and supply facilities, now in the basement, will be on the first floor of the new type and there will be almost no basements in the new buildings. The company administrative offices will be on the first floor. A center wing extending back from the main section will contain two adjacent dining rooms and kitchens. In the two extreme wings, will be the supply room, storage facilities, noncommissioned officers' quarters, lounge, and bath facilities. The second floor will have two day rooms in the center wing and in the main stem there will be additional noncommissioned officer facilities. The two wings will each contain two 32-man squad rooms. They can be partitioned to provide 4-man roomettes, enclosed on three sides. The third floor will contain additional squad rooms in each wing and additional noncommissioned officer facilities.—News release.

Heavy Tank

Said to possess the greatest fire power ever placed on a United States tank, some details of the long-secret *T-43* heavy tank were revealed for the first time. The 60-ton tank has numerous improvements, including a long barrel 120-mm gun, power



Many new features revealed in *T-43* tank.

steering, automatic cross-drive transmission, and 1-piece cast hull. It is powered by an 810 horsepower, air-cooled engine and carries a crew of five. Its elliptical shape and low silhouette present no flat surfaces to enemy shells, and the sloping sides of the streamlined turret are intended to deflect direct hits. The new transmission is an important factor in increasing and maintaining combat efficiency of the crew for long periods. In addition to its high-velocity gun, the *T-34* has two 30-caliber machine guns, and a 50-caliber machine gun mounted atop the turret. It is possible to load, aim, and fire them from inside the tank without exposing any member of the crew.—News release.

To Mothball 'Missouri'

After continuous active service since her commissioning in 1944, the battleship *Missouri* is scheduled for inactivation this fall. Inactivation of the *Missouri* will leave the *Iowa*, *Wisconsin*, and *New Jersey* as the only three battleships in commission.—News release.

Lighting Equipment

The development of three new standard lighting equipment sets will provide better and faster illumination for field headquarters. Now standard, the 1½, 3, and 5 kilowatt sets are lighter, more durable, and more easily transportable than the equipment they replace. Two untrained men can assemble the largest set in 75 minutes and disassemble it in 65, while 5 and 10 hours, respectively, were required for assembly and disassembly of the old equipment. The modern design eliminates the necessity of splicing, pole climbing, insulators, plug and receptacle wiring, and tools.—News release.

Mobile Hospital

A mobile hospital equipped to handle 200 patients and designed to go into full operation only 4 hours after it is set up at the scene of a disaster was unveiled by the Federal Civil Defense Administration recently. The equipment costs \$26,435 and can be moved in a single van wherever it is needed. This mobile hospital is composed of a casualty classification room, three operating rooms, an X-ray room, laboratory, pharmacy, wards, and a shock treatment room.—News release.

Bantam Bomber

One of the smallest and lightest jet combat planes ever built in this country, the *A4D Skyhawk*, a midget Navy carrier-based atom bomber, is undergoing final preparations for its first flight. The tiny attack bomber is designed to outperform many current operational jet fighters more than twice its size. It will have a combat radius greater than present propeller-driven attack planes, and is designed to fly faster over greater distances, with a more powerful striking load than any other attack bomber. It is so small that it has been built without the folding wings traditional in carrier-based planes.—News release.

Furnish Graduates

Until the Air Academy produces its first class, expected in 1959, the Naval and Military Academies will continue to furnish graduates to the Air Force. Each academy will furnish the Air Force 30 percent of its graduating class under a new Department of Defense ruling it has been announced.—News release.

Tail Turret System

A remotely controlled tail turret system, which is capable of knocking down enemy interceptors in the night or in fog, gives the *B-47E Stratojet* added punch. The new system is especially adapted for high-speed jet operation. The system consists essentially of a tail turret mounting twin 20-mm cannon, a computer, control equipment, and search-track radar. The radar and the computer do most of the work. In danger areas the radar is switched to "search" to maintain a watch to the rear. When an attacking plane is picked

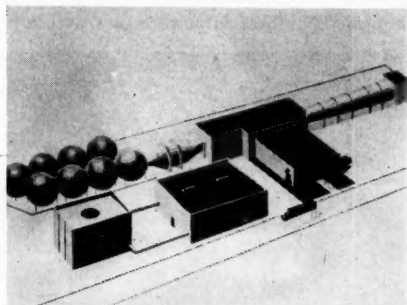


Radar controlled tail turret of *Stratojet*.

up, a "pip" shows on the radar screen, and once the target is centered in the crosshairs, it is tracked automatically. The tracking action supplies the computer with the necessary information, and when the attacking plane gets within range, the guns are fired.—News release.

Trisonic Wind Tunnel

A wind tunnel capable of testing airplane and missile designs at speeds ranging from 400 miles an hour to more than three times the speed of sound is expected



Proposed design of trisonic wind tunnel.

to be completed in March 1956. The trisonic test facility, so called because advanced airplane designs will be tested at speeds slower, equal, and faster than that of sound, will cost approximately 4½ million dollars.

Compressed air rushing from a series of large volume storage spheres at selected intervals will produce the required wind speeds. Each test will be less than a minute in duration. Technically, it will be the country's largest intermittent, blowdown tunnel. Other tunnels operate with a continuous flow of air, but construction costs are several times greater.

An adjustable nozzle, a transsonic chamber, and a variable diffuser will be placed in a series in the throat of the tunnel to regulate air speeds at subsonic, transsonic, and supersonic levels. This will enable adjustments to be made much faster than is possible in other tunnels. The tunnel's test chamber will handle an airplane or missile model with a wing span of about 4 feet. The chamber will be 17 feet long and 7 feet square. The wind tunnel will be one of the largest constructed by a private industry.—News release.

GREAT BRITAIN

Nose Opens

To permit easy loading of bulky freight, the nose and crew compartment of the *Ac-countant* are designed to swing aside on hinges. The plane is powered by two *Dart*



Nose swings open to facilitate loading.

turboprop engines and will seat from 22 to 33 passengers in a pressurized cabin.—News release.

Experimental Helicopter

The *Gyrodyne*, the first British helicopter to fly with the rotor driven by jets in the tips of the blades, has completed successfully its first test flights. The plane was designed to test some of the problems associated with tip jet propulsion for helicopters, and is not intended to go into mass



Experimental helicopter makes test flight.

production. Engine power is used to drive compressors which supply compressed air through hollow rotor blades to tip pressure jets. In cruising, the major part of the engine power is transferred to two pusher propellers.—News release.

Antisubmarine Force

To protect the nation's ocean lifelines, Great Britain is concentrating on building a vast antisubmarine force which will be equipped with new weapons to combat submarines, sea mines, and attacking planes. The fleet air arm is being rapidly re-equipped with jet and turbojet fighter planes, and new planes fitted with airborne early-warning radar are also being delivered. The main bulk of research and development is directed to antisubmarine, antimine, and antiaircraft work in which there are great technical difficulties according to the report.—News release.

Super Tank

Official details concerning the new super British tank, the *Conqueror*, are scarce; but it is known that it is powered by a *Meteor* aircraft engine, that it is heavier



Super tank will undergo troop trials soon.

in weight, and bigger gunned than any existing British tank. It is in limited production and will shortly be assigned to British troops in Germany for troop trials. Despite its size and weight, it is said to be fast and maneuverable. Its big gun is reportedly stabilized, both vertically and horizontally, by an improved system of electronic control.—News release.

AUSTRALIA

Draft Calls

The Government has announced that it will require all young men, who are not British subjects, but who are ordinarily resident in Australia, to register for national service.—News release.

Major Defense Arm

A rearrangement of the defense system in favor of air power and the enlargement of the Royal Australian Air Force are some of the important changes being made in the country's defense policy, according to the Minister of Defense. The responsibility for air protection at sea within range of land-based aircraft would be assigned to the Air Force.

The Navy would give priority to surface antisubmarine vessels. The Minister said the country could not hope to have two air arms on a scale previously contemplated, but that it did not mean the abolition of the Naval Air Arm, although it would have to be reduced. Greater emphasis will be placed on land-based air power in the new system.

It was pointed out that the country could not maintain three permanent forces and a large citizen force as well. The Army is predominantly a citizen force and is being built up through national service training to its mobilized target of 115,500 men. A study of the size and cost of the Regular Army is to be made after the expiration of the present commitments in Korea.—News release.

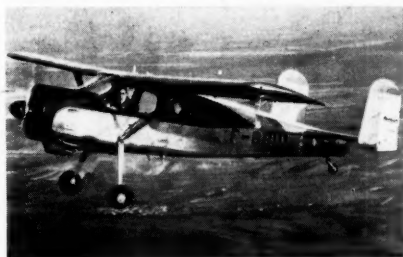
Pact Study

Feeling that collective security measures are required, Australia has agreed to join with other countries in examining the possibility of a system of collective defense for Southeast Asia and the western Pacific. An assessment of the military problems involved has already been made by Australia's chiefs of staff.—News release.

FRANCE

Rugged Freighter

The *Max Holste 1521 Broussard* is a rugged light freighter designed for operation in French Africa because of its ability to land and takeoff in areas where ground facilities are not adequate for conventional



Rugged freighter can land on small fields.

planes. It requires a minimum of servicing. The plane has a cruising speed of 146 miles an hour and can takeoff or land in a 410-foot space. In addition to its use as a freighter, it is capable of carrying seven passengers, or being used for air evacuation of the wounded.—News release.

Improve Performance

Additional tests indicate that the payload of the *Breguet 763 Provence* (MILITARY REVIEW, p 70, Mar 1954) may be increased by 25 percent and its range of action by 40 percent. The cargo version of the plane can carry 17 tons of freight over 932 miles. Recent studies have shown that it can carry eight helicopters similar to the *Bell 47* without any special modifications.—News release.

COMMUNIST CHINA

Oil Sources

More than 650 tons of oil will be produced this year in East China from silkworms in the chrysalis stage, from tea seeds, and from camphor seeds according to a recent announcement.—News release.

TURKEY

Defense Pact

A pact providing for friendly co-operation between Turkey and Pakistan in the field of planning for joint defense against unprovoked attack on either side, as well as in the economic and cultural spheres, has been signed recently by the two countries. The 5-year pact is renewable automatically, unless one of the signatories gives notice of termination 1 year before expiration is due.—News release.

POLAND

War Hulks

All Polish territorial waters in the Gulf of Danzig have been cleared of shipwreck according to a recent announcement. Over 375 ships sunk during World War II, including the German battleship, *Gneisenau*, and several submarines, had been raised.—News release.

NORWAY

Submarine Base

The main submarine base of the Norwegian Navy has been transferred from Trondheim to Bergen.—News release.

Machine-Gun Carriages

An \$84,853 off-shore contract for delivery of machine-gun carriages has been signed between a Norwegian factory and a United States Ordnance Center in Western Germany.—News release.

EAST GERMANY

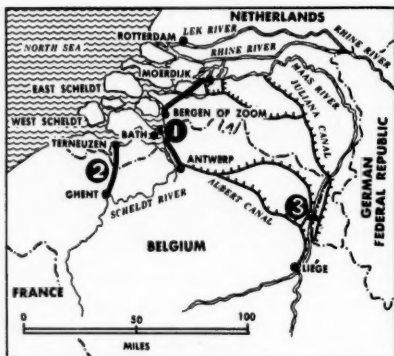
Rail Needs

About 1 million tons of railroad tracks have been ripped up and carted away from the East Zone of Germany by the Soviets according to the reports of the West German Institute for Economic Research. The Institute officials estimate that over 6,000 miles of railway in the Soviet Zone need restoration and repair which would cost an estimated 235 million dollars.—News release.

THE NETHERLANDS

Canal Construction

Plans calling for the construction of major waterways projects costing more than 101 million dollars were announced recently by the Governments of the Netherlands and Belgium, with the major share



Proposed projects to improve waterways.

of the expenses being paid by Belgium. The projects call for a canal joining Antwerp and the Scheldt River to the Rhine; the enlargement and partial rerouting of a canal that links the Belgian port of Ghent to Western Scheldt, to permit large sea-going vessels to reach Ghent; and the construction of a canal, designed for ships up to 2,000-tons capacity, to be built north of Liège, joining the Albert and Juliana Canals and providing a shorter route from the Ruhr in Western Germany to the Liège industrial area. The proposed Scheldt-Rhine Canal will be 37 miles long, and will begin at the docks of Antwerp. From there, it will run northwest to Eastern Scheldt, and continue in this sea arm behind a dam to be constructed. Then, from a point northwest of Bergen op Zoom, it will curve through Dutch territory to Moerdijk on the Hollandschdiep. A canal across the narrow neck of South Beveland, near Bath, would join the new waterway in the Eastern Scheldt.—News release.

JAPAN

Warships

An agreement with the United States for the lend-lease of four American warships has been approved by the Japanese cabinet, according to a recent announcement. Under the agreement, Japan will get two 1,600-ton destroyers and two 1,400-ton destroyer escorts, in addition to frigates that Japan received from the United States after their return by the Soviet Union.—News release.

Rebuild Air Force

In a program that is expected to take place over a period of 3 years, the Japanese Air Force is to be made the strongest in the Far East with the assistance of the United States. The Japanese Government has agreed to the creation of a tactical air force which will consist of 1,300 aircraft.

It will have approximately 500 *F-86 Sabres*, 100 twin-jet light bombers—possibly *B-57 Canberras*, 100 *C-47 Dakotas*, and photographic, liaison, and training aircraft. More than half of the air bases in Japan presently used by the United States Air Force will be returned to enable 300 jet fighter pilots to be trained this year.—News release.

BRAZIL

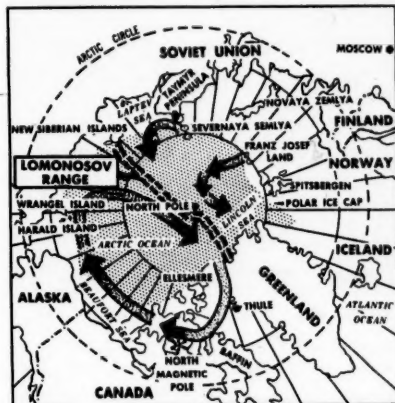
Oil Monopoly

In an effort to find oil sources in Brazil which would make the country self-sufficient, the Petrobras program has been organized. The organization starts out with assets of 125 million dollars in oil fields, refineries, pipelines, and tankers transferred to it by the Government, which will retain 51 percent of the initial stock issue. This will allow the Government to maintain its oil monopoly. Brazil consumes more than 1 million barrels of oil annually, of which 90 percent is imported according to the report.—News release.

USSR

Ice-Floe Bases

The great ice floes of the Arctic do not make reliable floating fortresses according to a leading Soviet polar scientist. The polar ice masses do not follow the general laws of sea drift from east to west ac-



cording to him. The great floes move in certain observed patterns, some of which are strongly dependent on their position relative to the great underwater mountain range, the Lomonosov Range, that transverse the Arctic from the New Siberian Islands to Ellesmere Island. For example, the floes forming near Franz Josef Land move first northeast, then north, and finally southwest. Those formed near Severnaya Zemlya (Northern Land) are carried to the Laptev Sea and then along the southeast side of Severnaya Zemlya and the Taimyr Peninsula to latitude 76 degrees north, and then northeast. Ice islands formed near Ellesmere Island follow a route from the Lincoln Sea through the Canadian Arctic Archipelago toward the Barrow Strait to latitude 73 degrees north. They then move north of Wrangel Island to the northwest and north, a little south of the North Pole, and then back to Ellesmere.—News release.

ARGENTINA

Glider Trainer

The I.A. 41 *Urubú*, the country's new 2-seat, side-by-side glider trainer, has made several successful flights according to a recent announcement. The new glider is built of wood and is 19 feet long with a



Glider trainer makes successful flights.

wing span of 59 feet. There is only one instrument panel for the pilot. The glider has a landing speed of 33 miles an hour and can carry a load of 440 pounds. It is equipped with a retractable landing gear.—News release.

WEST GERMANY

May Supply Fuel

West German petroleum companies have been invited to bid on contracts to supply 1,700,000 barrels of jet fuel to the United States Air Force in Europe. The contracts also involve 2 million barrels of motor vehicle gasoline. It is estimated that the combined value of the two orders is between 15 and 20 million dollars. If the German companies submit acceptable bids, the Air Force and Army should save money on transportation costs. The fuel would be supplied to bases in France and Germany. According to the announcement, this is the first time German companies have been asked to bid on jet fuel, although they have supplied limited amounts of gasoline since January.—News release.

BULGARIA

Develop Air Force

It has been reported that the Bulgarian Air Force, in violation of the peace treaty, has reached a strength of 300 aircraft. Except for a few German World War II types, all the planes are Soviet-built. To some extent, the fighting units are equipped with *MiG-15* and *Yak-23* jets. Bombers, ground-support fighters, and transports are all piston-engine types of World War II vintage.—*Aviation Age*.

THAILAND

Offer Bases

Military bases in Thailand have been offered to nations of the free world to aid in resistance against a further Communist advance in Southeast Asia according to the Chief of the Thai General Staff.

Prior agreement on terms and conditions would have to be reached with the nation concerned before bases would be granted. It was indicated that a large portion of Thailand's armed forces and frontier policemen have been ordered to the eastern border which adjoins the Indochinese states of Laos and Cambodia.—News release.

AFGHANISTAN

Foreign Capital

In an effort to create a favorable climate for foreign investors, a foreign investment law granting capital from abroad equal treatment with national capital has been adopted by Afghanistan.

Under the new regulations, not only will foreign capital invested in the country have equal status with domestic funds, but provision is made for the transfer of profits abroad after the payment of income taxes, and for the repatriation of capital. Foreign employees of enterprises subject to the law are allowed to transfer abroad up to 70 percent of their salaries.—News release.

FOREIGN MILITARY DIGESTS

The Future of the Tank

Digested by the **MILITARY REVIEW** from an article by Brigadier C. N. Barclay in
"The Army Quarterly" (Great Britain) October 1953.

THE pattern of future war is a very difficult thing to forecast, and in modern times so many prophecies have been wrong that to dogmatize on any aspect of the subject would be foolish. That is not, however, a good reason for shirking the issue. Obviously if we give it thought, and subject it to close examination, we are more likely to be right than if we dismiss the subject from our minds as beyond our ken and trust to luck.

With the exception of aircraft, no modern invention played a bigger part in resolving the issues of World War II than the tank. It played the predominant part in the defeat of Poland (1939) and of France (1940) and in the early German victories against the Soviet Union. In the latter years of the war, tanks were engaged in large numbers in every major theater of operations. So much was this the case that, to the uninitiated, land warfare at once conjures up visions of long columns of tanks, or tanks in large numbers, dashing across country—although the better informed know that other arms also have a hand in the matter.

Three of the four British divisions in the Northern Army Group are armored divisions, and all other leading powers regard the tank as a major Army weapon. If, therefore, we wish to examine the likely pattern of land operations in another great war, we cannot do better than investigate the future of the tank.

History usually provides analogies for military problems, and the problem of the tank is not an exception. For centuries the horse cavalryman played a leading role in war, and one which was not unlike that of the tank. Like heavy tanks, heavy cavalry was used to break into an enemy position. Like light tanks, light cavalry was employed on reconnaissance and in pursuit. At sea, the battleship was provided for much the same purpose as the tank on land—to produce a large volume of mobile fire power, while it was comparatively immune from fire. In recent times, cavalryman and battleship have both received their dismissal for reasons which are somewhat similar. The cavalryman and his horse ceased to be effective instruments of war because they were too

vulnerable to modern fire, and their mobility had become too limited in distance in comparison to mechanical vehicles, and too restricted by barbed wire and other obstacles. The battleship has been all but driven from the high seas because it is too vulnerable to modern missiles—the aerial bomb and aerial torpedo and the submarine-launched torpedo. It is also liable to fall victim to sea “obstacles” in the form of mines. As the Navy’s “capital” ship, the battleship has now been replaced by the aircraft carrier, which is equipped with new kinds of long-range weapons of offense and defense—bomber aircraft to attack enemy ships and fighter aircraft to shoot down enemy bombers.

It would appear that these two analogies are appropriate guides to the likely trend in tank warfare, and it is, therefore, possible to reduce the problem to these simple terms: Will the tank become so vulnerable to modern antitank weapons, and its movements so restricted by obstacles, as to reduce it to impotence in battle?

It will be convenient to begin by summarizing the various antitank weapons and devices for impeding tanks; and to follow this by an investigation of the methods by which the modern tank can counter them.

Antitank Weapons and Tank Obstacles

1. *The antitank gun.*—During the last war, antitank guns of great power, which could penetrate the armor of most tanks, were produced. The German 88-mm and our own 17 pounder are examples. To immunize tanks against guns of this kind, they had to be very heavily armored and this produced attendant difficulties. The heavier tanks were ponderous in movement, unsuitable for traversing small bridges and light bridging equipment, liable to become bogged in wet ground, difficult to transport across inland waterways, and very conspicuous and exceedingly costly.

It is no secret that since the war much more powerful antitank guns and more effective ammunition have been manufactured in our own and other countries. By the end of the war, the tank had nearly reached the limit in weight of armor. It would appear, therefore, that antitank guns exist whose shells can penetrate any thickness of armor with which it is practical to equip a tank. It must, however, be remembered that these powerful guns are heavy, cumbersome, and difficult to conceal, and thus, themselves, vulnerable to fire from many quarters.

2. *Missiles from aircraft.*—In the latter years of the war, allied low-flying aircraft of rocket-firing types caused great havoc among enemy tanks. Success by this method is, however, dependent on a high degree of air supremacy, which the allies possessed at that time. Moreover, if tanks are equipped with, or accompanied by, efficient weapons for dealing with low-flying attacks, the task of the aircraft is greatly increased.

3. *Short-range antitank weapons.*—Several very efficient weapons of the “bazooka” type exist today, whose missiles are reputed to be capable of penetrating very thick armor. These weapons can be carried and operated by two men and are, in consequence, easy to conceal. In the hands of well-trained, and resolute, men they are capable of attaining almost complete surprise in close country, or country of the “hedge and ditch” type. Under suitable conditions, these are likely to be very formidable antitank weapons if issued on a generous scale.

4. *Mines.*—Antitank mines played an important part in defensive battles in the last war. Many tanks were destroyed by this means, and many more put out of action temporarily. But perhaps the mine’s greatest value was the caution which it imposed rather than the actual destruction caused. By imposing caution—by the mere knowledge that mines might be en-

countered—the tanks often lost their impetus and maneuverability, and so became easier targets for antitank artillery.

It is, however, obvious that the land mine is a two-edged weapon which in a war of movement must be used with discretion if the risk of injuring, or inconveniencing, friendly forces is to be avoided. Moreover, the supply of mines will always be limited, and in consequence they will only be used in quantities in a prepared defensive position, or in a defile which the tanks cannot avoid. This, in turn, gives the attacker the time and opportunity to locate and neutralize them by means of "flail" tanks and other devices.

It is unlikely that antitank mines will prove more effective in the future than they were in the latter years of World War II.

5. *Other obstacles.*—The natural obstacles to tank movement are legion—mountains, rivers, forests, and wide ditches—but in many cases they are not effective obstacles unless covered by well-directed fire.

Artificial obstacles, such as antitank ditches, ironwork obstacles of the type which existed in parts of Belgium in 1940, and road craters, take a long time to construct, and are even less effective than natural obstacles unless covered by fire.

It would seem that, as with mines, natural and artificial obstacles will frequently hinder tanks, but no more than in World War II.

6. *Atomic weapons.*—It is difficult to predict the future of atomic weapons in the tactical field, as the information available is, as yet, very scanty. In the mobile type of warfare which we visualize, it would appear that the use of atomic weapons is likely to be very restricted, and that the difficulty may be to devise types with a local effect, rather than weapons of obliteration like the atom bomb. An antitank low-trajectory shell with an atomic charge is, no doubt, a practical

proposition, but would probably do no more than the most powerful shells of normal type, which we believe are already capable of penetrating the thickest armor which a tank can carry. There is no point in "over killing" a tank.

Perhaps the greatest tactical potentiality is in the field of high-angle artillery fire at long ranges (up to 20,000 yards). Previously, this kind of fire has not been effective against well-dispersed tanks, as a direct hit is necessary, and this is not a very frequent occurrence. With an atomic shell, it might be possible to put out of action all tanks within several hundred yards of the detonation. The decision to use a weapon which would cause so much destruction to matériel, other than tanks, and produce a considerable radio-active aftermath of long duration would, of course, be a very serious one in fast-moving operations, and this alone would strictly limit action of this type.

It is reasonable to suppose that tactical atomic weapons will not be used extensively against tanks in the near future—if ever. Assuming that atomic weapons are used at all in another great war—which is by no means certain—they will probably be confined to long-range action against columns, or concentrations, of tanks in areas well to the rear—by means of atom bombs dropped by aircraft, or possibly atomic missiles fired from projectors of the rocket type.

7. *Other considerations.*—There are other matters affecting tank warfare indirectly which merit consideration.

In North Africa, during Field Marshal Rommel's final bid for Egypt, it was shown how the fuel supplies of a tank force can be restricted if the theater of war is dominated by a hostile air force. Later, in northwest Europe in 1944, the German *Panzer* divisions were almost entirely confined to movement by night, and greatly handicapped by shortage of gasoline, by virtue of the allies complete

mastery of the air. It is perhaps too much to say that air superiority is essential for large-scale armored operations, but it is a prerequisite of success not to be overwhelmed in the air.

The question of morale among tank crews requires serious thought. If, as is contended earlier in the article, no tank is likely to be safe against the fire of the most powerful antitank guns and short-range weapons, is morale likely to suffer? Experience shows that when tank crews know that their tanks are liable to penetration by enemy weapons, morale falls very steeply. As this condition is likely to be the rule, rather than the exception, this is clearly a very important matter. It may be argued that the infantryman has always been liable to "penetration" by even the smallest caliber weapons, and yet he has survived, with his reputation as a battle-winner undiminished. The analogy is not, however, a good one. The tank is very difficult to conceal, whereas the smallest rock, fold in the ground, or tree stump provides good cover for a foot soldier, whose movement is simultaneous with his thoughts and instincts—not ponderously controlled through the medium of a complicated internal-combustion engine, and a number of gears and levers.

We can, therefore, summarize this investigation of antitank weapons and methods, by saying that the tank's greatest danger, by far, is the powerful armor-piercing shell and the new type of hand-operated, short-range, antitank weapon. The airplane will be an annoyance, but not a decisive factor, except under conditions of serious air inferiority. In open country, mines will be a hindrance, but one which can often be overcome by resourceful and well-trained tank units. Natural obstacles will obviously vary in different parts of the world. Very mountainous country may preclude the employment of tanks altogether; but in average

European terrain tanks of suitable design, with skilled crews, will usually find a way over or a way around.

The Modern Tank

Having examined modern weapons and methods for destroying tanks, we can now turn to the tanks themselves, and thus form some conclusions on the balance of developments between the tank and the antitank devices.

As this is not a technical article, it is not intended to do more than discuss the types of tank likely to be employed and the general trend of recent tank development.

In the British Army we have, since the war, relied on an all-purpose tank—the *Centurion*. This is, undoubtedly, a fine piece of equipment, but to many it is not possible to design a tank which is satisfactory in the assault on a prepared position and also suitable for the highly mobile roles of reconnaissance, deep penetration, and pursuit. Most authorities now accept the view, held in the armies of other leading powers, that two types are required:

1. *An assault tank of great power for co-operating with other arms in an attack on an organized defensive position.* This tank would be safe against all weapons except the most powerful antitank artillery and hand guns—against which, as already stated, it would appear impossible to provide sufficient thickness, or quality, of armor.

2. *Light tanks, for reconnaissance, exploitation, and pursuit.* These would be splinter-proof and safe against small arms weapons. They should be fast, maneuverable, and very reliable.

It now remains to investigate whether modern tanks are likely to be able to fulfill these roles when opposed by an efficient enemy armed with antitank weapons of the type described.

The Assault Tank

It will be apparent that for success in an attack against a well-organized defensive position some means must be found by which tanks can avoid the fire of the heaviest antitank guns, which are capable of penetrating the armor of any tank, or, effective methods of neutralizing these weapons must be provided. In a contest of this kind, the gun has a very considerable advantage. It will be very carefully concealed and protected by earth, and possibly concrete, depending on the length of time which has been available to the defenders. It will have ample supplies of ammunition and the gun teams will have made a detailed study of the ground. The tank, on the other hand, will be exposed, the crews will be less well acquainted with the ground (including the location of mine fields), and its limited armament will be restricted in ammunition. These seem to be very formidable handicaps, which require a special technique to overcome.

An assault of the kind we are considering is, of course, an operation by all arms. Although—as was frequently the case in the last war—the tanks may be the major partner, there is little chance of success unless the other arms—artillery, infantry, engineers, and Royal Air Force—co-operate to the fullest extent possible. Every effort must be made to locate and destroy antitank guns by low-flying air attack and artillery fire before the assault is launched, and to locate and neutralize mine fields. Infantry must be prepared to open fire on, and wipe out, in the course of the attack, any hostile antitank guns which have not been neutralized previously.

Unless attacks of this kind are carefully rehearsed, and a high standard of co-operation between arms attained, they are not likely to be successful in daylight against a skillful and resolute enemy.

It would seem, however, that if tanks

can be trained to assault by night, as a matter of routine, they will avoid the main disability from which they suffer in daylight—observed fire from powerful antitank guns.

It is true that at El Alamein, and on other occasions, tanks attacked with success in the dark; but it is not common practice to do so. Aided by modern science and developments, there is no reason why night attacks should not be the rule, in the future, rather than the exception. Night operations are, perhaps, the one aspect in the field of tactics which has not been fully explored. There is a great future for an army which can fight by night, with efficiency comparable to that which is normal by day.

Smoke, which is a very useful aid in small-scale operations, is rarely a good substitute for darkness in major operations. It is too dependent on the vagaries of the wind and its effect is too uncertain.

It is suggested that the future usefulness of the assault tank depends on improved co-operation with other arms and improvement in the technique of night fighting. This cannot be accomplished unless more combined training is practiced than was customary during the war. Then it was quite an event for tanks, infantry, and artillery to train together, except for very short periods and in a very cursory manner.

The first experience of many infantry units in working with tanks took place on the battlefield—with unfortunate consequences in some cases.

Similarly, night operations require study and practice in a much more thorough and determined manner than has been the case previously. The many artificial aids which are now available have not been fully developed or explored.

As with every operation of war, a tank attack depends for success, in the final count, on the skill, resourcefulness, and

courage of officers and men—attributes which will not be lacking in our tank crews if they are encouraged by receiving the equipment and up-to-date training they deserve.

The Light Tank

The role of the assault tank demands meticulous preparation, very close co-operation with other arms, ability to fight at night, and tenacity. Tactical surprise is not an element which can be exploited very often in a set-piece attack.

The role of the light tank is very different. Success will depend on ability to take advantage of fleeting opportunities, rather than careful preparation; tank units and subunits will frequently operate on their own, unsupported by other arms. Night movement will be frequent, but contact with the enemy will more often be by day. Surprise will be a very important, and frequently a decisive, factor.

Tanks in this role will normally form part of an armored division, and will be closely supported by the infantry and other arms of the formation. In a reconnaissance role they will, on occasions, come in contact with an enemy in a prepared position, but will not be expected to press home an attack against formidable defenses. An armored division should possess a small number of assault tanks (carried on tank transporters) for the purpose of overcoming enemy strongpoints which cannot be outflanked or bypassed. In their major role of exploitation and pursuit, they will usually be opposed by an enemy who has already been defeated in battle, or possibly one who has "poked his nose" out too far and is not supported by heavy equipment. It will often be the case that the enemy is in some degree of confusion, with his morale at a low ebb. In any event, it will be fighting of a fluid nature on wide fronts, with flanks which can usually be turned and an enemy holding positions which can be bypassed

and dealt with by other troops following in the rear.

The comparatively lightly armored tanks performing this role will rely on speed of movement, maneuverability, and, above all, surprise, to avoid enemy heavy anti-tank weapons.

It must not, however, be supposed that these tasks will be accomplished without battle casualties and heavy losses of tanks due to accidents and mechanical breakdowns. Those who have studied the advance of General Patton's Third American Army across France in 1944—favored as it was by complete air superiority, and opposed by a very badly shaken enemy—will appreciate the immense losses in tank strength which is likely in operations of this kind, even under the most favorable condition. Unless the tanks are of a reliable type, the standard of training and maintenance high, and the higher command maintains good control, the force will soon dwindle and become incapable of sustained action. Good communications, an efficient repair organization, and carefully planned arrangements for supply—particularly fuel—will play a very important part.

It can be said with reasonable confidence that the easy *Panzer* victories in Poland (1939) and France (1940) are not likely to be repeated. The tank has lost much of the terror, which was one of its chief assets in those days, and commanders will be less sensitive to deep penetration by tank forces. Improved antitank weapons, with which *all* arms will be equipped, may exact a heavy toll. The armored division in a future war will have to be very skillfully handled if it is to be successful, and keep the field for a long period. Even so, the plan of campaign will have to include a system of reliefs by which armored formations, in turn, receive frequent periods of rest to refit and reorganize.

In this brief examination of the future

role of the tank, and the probable pattern of tank warfare, I have assumed that two types of tank are necessary—the heavily armored assault tank and the mobile light tank. I am aware that this view is not universally accepted. There are some, whose views merit great respect, who consider that a “general purpose” tank is a practical proposition.

They argue that with proper artillery and other support a moderately heavily armored tank, of the *Centurion* type, is adequate in an assault against a prepared position, and that the same tank, although slower than a conventional light tank, will give added “punch” to the armored division without seriously impeding the speed of operations.

In support of this theory, they cite the Korean campaign, where the British *Centurion* tanks are claimed to have been much more successful than the lighter-armored American tanks.

It is submitted that Korea is not a good example. Except at the very beginning, the campaign was one of position warfare, in which tanks have had no opportunity to operate in the true role of the light tank.

It may be that the *Centurion* is a good assault tank. Although not carrying the very thickest armor, it is probably safe against all but the heaviest antitank weapons, and consequently no less vulnerable than a tank carrying the heaviest armor—which we believe can now be penetrated by the most modern ammunition. It is in the mobile role—which has not been properly tested in Korea—that the *Centurion* would appear to fall short of requirements.

It has difficulty in negotiating narrow roads with steep banks, narrow bridges, and water-logged ground. In fact, it is not sufficiently handy, or maneuverable, for the mobile role.

The balance of argument seems to be in favor of two types of tank, for the two

very different roles which tank units will have to fulfill in a future major war.

Conclusion

Earlier in this article, dogmatic views on these highly controversial matters were disconnected. I, therefore, make no claim to infallibility in coming to the following conclusions:

1. Antitank weapons and devices have improved to a considerably greater extent than the tank's ability to counter them.

2. The tank will still play an important part in land operations, but the easy tank victories at the beginning and end of the last war are not likely to be repeated in the early stages of another war.

3. That a modern army requires two types of tank.

- a. Assault tanks, carrying heavy armor and armament, for attacking prepared positions.

- b. Light tanks, for reconnaissance, exploitation, and pursuit as part of the armored division. Their characteristics should be speed, maneuverability, and a long range of action.

4. That assault tanks must always operate in very close co-operation with artillery, infantry, and other arms, and must be prepared to carry out an attack by night as a matter of normal routine. These two requisites demand much more combined training with other arms, and much more in night work, than has been the custom previously.

It is not easy to predict the tank's place in warfare of the distant future; however, in 1953, it may be said that, *vis-à-vis* anti-tank weapons, the tank was in much the same position as the horse cavalryman was in 1914 in relation to the machine gun and barbed wire, and as the battleship was in 1939 in relation to the torpedo (submarine and aerial-launched), the aerial bomb, and the mine. As with these two, at the times stated, the tank remains a major weapon of war, but its position is

seriously challenged and its future in dispute. We must not, however, carry these analogies too far. The horse was a "vehicle" capable of only very limited improvement, whereas the ingenuity of the scientist and the engineer can make a wide range of alterations and adaptations to the tank to meet changing requirements.

The tank also possesses advantages over the battleship in being a much smaller unit. With the ironclad, costing many mil-

lions of dollars, most eggs were in one basket; but this is not the case with the tank, the cost of which is measured in mere thousands.

We cannot be certain, but it would appear that the tank will be a major equipment, for an indefinite period, in the army of any country which has the technical ability and resources to make efficient tanks and the ingenuity to produce improved types to meet conditions which will change very frequently.

Role of Guided Missiles in Tactical Operations

Digested by the MILITARY REVIEW from an article by Wing Commander V. N. Bhardwaj in the "Indian Air Force Quarterly" January 1954.

SINCE World War II, during which the Germans produced the V-2, scientists in all the major countries have concentrated on developing remote controlled guided weapons of greater accuracy, reliability, and effectiveness. Technical advances so far achieved have tended toward making the direction of missiles more and more automatic.

The great speed of modern bombers has created difficult problems of interception and anti-aircraft defense. The employment of guided missiles in the defensive role holds forth a promise of help in this direction. Whether or not they will perform an important function in major combats and prove an absolute weapon in future wars remains to be seen. The purpose of this article is to examine the recent general trends in the development of these new missiles and their potentialities in the tactical role.

What Is a Guided Missile?

A guided missile can be defined as a space traversing, unmanned weapon which carries within itself a means to control its flight path. By this definition, an artil-

lery shell is not a guided missile although it is guided during the first part of its trajectory by the barrel of a gun. A V-2 rocket is a guided missile, although guidance of its flight is provided only during the beginning of its travel. In a true guided missile, guidance comes through a mechanism within the projectile throughout its journey. Guidance has been perfected through the use of radar, electronic computers, and the autopilot. A guided missile may be either in the shape of a pilotless aircraft like the V-1 or like a guided rocket as the V-2.

Types of Guided Missiles

Generally speaking, the following four main types of guided missiles are being developed for the defense services: surface-to-air missile (SAM); surface-to-surface missile (SSM); air-to-surface missile (ASM); and air-to-air missile (AAM).

The list can be increased by the addition of four more categories; surface-to-submarine, air-to-submarine, and the reverse. In some cases one missile can be used in two or more roles. For example, an air-to-surface missile might also be

effective as an air-to-ship missile and so on.

With ever increasing flight ceilings of modern aircraft—possessing greater speed and maneuverability—antiaircraft artillery cannot provide adequate defense against air attack. The long time of flight of an artillery shell would permit aircraft to fly away from the predicted point of interception.

Surface-to-Air Missile

Until they become supersonic, interceptor aircraft are not really effective against high speed bombers, as they are fast losing the speed advantage that they once enjoyed. Therefore, a more certain method of attacking the modern bomber is to fire a SAM, which not only has a greater speed, but also the ability to change its course according to a bomber's position.

These weapons intercept their target either by following a radar beam or by responding to radio signals from the ground. At present these missiles are supplementing anti-aircraft artillery but they might easily assume the major role in future anti-aircraft defense.

Surface-to-Surface Missile

The role of SSMs is to attack surface targets when aircraft or artillery cannot be used or are less desirable due to their inherent drawbacks. In these missiles, target seeking methods of guidance are not applicable as many surface targets have no outstanding features to enable the missile to distinguish the target from the background. They are, therefore, suitable for area targets only.

In modern warfare, the important tactical targets are progressively moving farther from the front. SSMs cannot only neutralize such large area targets but can also contribute to the isolation of the battlefield. If SSMs eventually have accuracy exceeding that of fighters and

bombers and are capable of carrying atomic warheads, their employment will become primary rather than secondary.

Air-to-Surface Missile

A guided missile launched from an aircraft and destined for a ground target is known as an ASM. Accuracy of bombing from conventional aircraft is limited, especially from high altitude. To achieve better accuracy, a close-in attack has to be resorted to, which is prohibitive if the target is well defended. Hence, it is desirable to release the bomb from a distance beyond the range of anti-aircraft fire without sacrificing accuracy. The ASM fills this need as it is effective against ships, bridges, trains, or, in fact, against any well defined and well defended targets which can be easily distinguished against their background. This characteristic permits the use of automatic target seeking devices. The missile will probably be used most effectively in attacks which previously involved a small number of aircraft. These missiles are of three types: the glide bomb; the powered bomb (the German V-1 and the United States *Loon*); and the radio controlled bomb with a target seeking device.

The glide bomb was one of the first to be developed during World War II. It incorporated a simple improvement on the standard bomb for increasing its range by addition of control surfaces which help it to glide to its target. This provided an added advantage to the bomber aircraft carrying it, in that it could release its bomb load a few miles from the target and thus keep away from concentrated enemy defenses. This also helped to extend the range of conventional aircraft. However, without any external or internal control the glide bomb did not lend itself to any appreciable accuracy.

The powered bomb with wings was an improvement on the glide bomb and was first developed by the Germans in the last

war in the shape of the V-1, a pilotless aircraft launched from a ground station for low level attack. It maintained its flight on a jet engine. At a predetermined point over the target, the fuel was cut off and the aircraft stalled and dived at an angle of about 60 degrees onto its target.

The radio controlled bomb was developed and used in the last war. An earlier scheme was incorporated in the X-4 missile which was "wire controlled." Command impulses were transmitted directly from the launching aircraft through fine wires, which unwound from bobbins on the missile. Later, the Americans developed the vertically controlled bombs, the *Azon* (Azimuth controlled only) and the *Razon* (Range and Azimuth controlled only), which incorporated target seeking devices, and were controlled by radio by the dropping aircraft circling overhead. The *Azon* was a standard 1,000-pound bomb, fitted with gyros, batteries, radio receivers, a flare, and antenna in the tail end of the bomb. It was fitted with gyro controlled ailerons (or roilerons) which stabilized against roll, and with rudders which allowed steering in Azimuth. Against a long narrow target like a railway bridge, where Azimuth control is all that is needed, the *Azon* achieved great accuracy. The number of hits per 100 bombs dropped were 25 for *Azon* against 1.7 for standard bombs. The *Razon* was an improvement on the *Azon* and the efficient rudder control, helped by elaborate instrumentation and stimulation devices, changed near misses into direct hits. These bombs were used in the European and Burma theaters with considerable success against comparatively small targets, such as bridges.

Tactical Support Requirements

The efficiency or usefulness of tactical weapons can be measured only by the amount of support they are capable of providing to the ground combat soldier. This depends directly on various factors,

such as: range of action, striking power, accuracy of aim, volume of fire, and portability.

Let us now see how the guided missiles show up when weighed in the balance against conventional weapons of tactical support.

Guided Missile versus Artillery

Artillery has certain inherent limitations in range, lethality, and accuracy. The last two limitations are, to some extent, overcome by mass fire. But range can be improved only by increased velocity accompanied by greatly increased size and weight of the gun. The upper limit in range appears to have been reached at 20 to 25 miles. The SSM has a much longer range and is more accurate, lethal, and powerful. It is useful for accurate demolition fire both against heavily protected targets within artillery range and targets of many kinds beyond that limit.

Guided Missile versus Aircraft

Air operations depend very much on the weather, and thus are not capable of continuity of fire support so essential to modern warfare. If fighters and bombers are employed in a close support role over a heavily defended enemy territory, the losses are likely to be high, even prohibitive. The limited accuracy of aircraft bombing, especially high level, is a point against their universal use in the tactical role. Finally, modern jet aircraft require much longer runways compared to a few square feet required for a guided missile launching site.

Another advantage which guided missiles enjoy over aircraft is "speed." The V-2 drove past at a speed more than twice that of sound, unseen and unheard until it exploded. Although British radar could detect a V-2, none were ever intercepted. Thus, the weapon is capable of achieving complete surprise without giving any

warning to the enemy for taking defensive measures.

The guided missile promises to supply the answer for defense against the modern jet bomber built for extreme height (40,000 to 60,000 feet) and high speed (550 to 600 miles an hour). The normal antiaircraft shell cannot get to a height greater than 35,000 feet; hence, fast climbing guided missiles only are likely to intercept the modern bomber. The poor accuracy of the conventional antiaircraft shell is another point in favor of the adoption of the SAM in spite of the high initial cost for each round.

Tactics and Technique

1. *The offensive role.*—For the purpose of penetrating the enemy's front, guided missiles can be used for direct support of our own troops and for isolation bombardment of the area to prevent the enemy from committing his resources. In envelopment, a similar isolation will hinder the movement of his reserves to a flank. Attacks on his communication bottlenecks will also prove profitable.

2. *The tactical defense role.*—In defensive, also, guided missiles can play a vital role. An enemy on the offensive must concentrate his forces which can be attacked with advantage. If properly located, guided missile units will not have to move long distances to meet an unexpected attack. The enemy's superiority on the ground or in the air will not stop guided missile fire unless the launching sites are overrun or destroyed by bombing.

3. *Interception.*—The defense against an air attack by a large number of high speed bombers carrying guided bombs, which can be released at a distance of 5 to 6 miles from the battle area, will present a great problem. The bombers must be engaged and destroyed at a distance much earlier than their point of bomb release. This task cannot be tackled by conventional artillery because of

limited range and the time lag for the shell to reach the target.

For interception by fighter aircraft, the speed of incoming bombers and the shortness of the time available for effective engagement require that the speeds and maneuverability of fighters be increased beyond the present level. The guided missile eliminates delays attributable to human reaction and might provide the answer for the interception of the modern bomber. There is a school of thought which believes that the course of the last war would have been different if the Germans had laid more stress on the development of their SAM to counteract the allied bomber offensive than on their SSM for the bombardment of London.

Limitations

1. *Accuracy.*—The use of guided missiles in the tactical role has certain disadvantages. First is its limited accuracy, especially when fired at distant targets.

Since 1950, some improvements have been made in different countries but the statistics are shrouded by secrecy. The dual problem of accurate location and missile dispersion is not easily solved, but there are definite indications that SSMs will ultimately be highly accurate.

2. *Range.*—It has been established by experimentation that the range of solid fuel rockets is less than that of liquid fuel missiles which can attain a maximum range of 450 miles. The ramjet, which is still in its initial stages of development, is theoretically capable of attaining a range of 3,500 miles. However, the fact that rockets can be fitted to submarines and surface ships brings most targets in the world within their range, as no target is beyond 1,700 nautical miles from navigable waters. Hence, a missile of about that range and reasonable accuracy is the goal of all research workers.

3. *Radio countermeasures.*—Being remote controlled by radar beams sent out

from ground radar stations to which the slave sets and computers built in the missile respond, guided missiles are greatly susceptible to radio countermeasures. We know from our experience in the last war how *Window* and *Mandrel* were developed to counter the enemy's warning system. Jamming of the radar control system and misdirection or decoying of the missiles by sending false commands to them is quite possible by the enemy. This might prove a great limitation in the employment of this weapon.

4. *Supply implications and costs.*—Another drawback is the logistic effort required to operate them, including construction costs and supply problems. A SSM ready to fire may weigh up to 10 times the weight of its warhead. This means that for every ton of high explosive delivered to the enemy, as much as 10 tons of material must be transferred to the launching site.

In the 100-mile range category, a guided missile may weigh from 3 to 10 tons. This amounts to firing a few rounds of ammunition, and then the gun is made useless because of the lack of ammunition. However, in spite of these tonnages the battlefield supply can be simplified because the missile can be brought up in light sections, assembled and fired from an area far behind the front lines.

Production cost must also be taken into consideration.

Approximately 80 percent of the cost of any item is labor, and this flows from the same manpower pool as the combat troops. During the last war, it required about 900 man-hours and cost 8,500 dollars to produce a V-1, and 4,000 man-hours to build a V-2 which had 30,000 parts and cost between 28,000 and 45,000 dollars. This is an impressive figure for a single round of ammunition. However, it is estimated that the total cost of destroying a target will be less with guided missiles than with any other weapon because

of the increased accuracy and lethality of this new weapon.

Employment and Operational Control

1. *Suitable targets.*—In view of the two major drawbacks, inaccuracy and high initial cost, the targets for SSMs must have two important characteristics; they must have an area large enough to cover the inaccuracies of the missile and they must be of unusual importance. At ranges between 20 to 100 miles, targets which may be considered appropriate are major troop concentrations, marshalling yards, supply depots, important command centers, ports, and beachheads. At closer ranges, say up to 30 miles, smaller targets like heavy fortifications, important bridges, troop and vehicle concentrations, and supply dumps may be considered profitable.

2. *Level of employment.*—To permit the use of mass fire and to ensure proper co-ordination, launching sites should be formed into unit size organizations, each of which should be capable of delivering 5 to 6 tons of explosives in one round. These units can then be allotted firing missions by the army group or the theater commander. Thus, on a large front with a number of armies, tremendous fire power can be brought to bear upon a target which is of vital importance to the success of operations in the entire theater. Fire control should, therefore, be at a high level.

3. *Operational control.*—Pilotless aircraft represent a normal extension and a refinement of the recognized role of the aircraft which the Air Force has been developing for years. Guided missiles are complementary to manned aircraft and will enhance their combat capabilities. Air warfare is an Air Force responsibility. It is, therefore, logical that Air Force personnel should man the launching sites.

Very recently, the British Secretary of State for Defense, Lord Alexander, announced that the Royal Air Force will con-

trol all ground-to-air missiles, although their role is complementary to antiaircraft organization operated by the Army. Similarly, a SSM unit may be attached to a division, corps, or army in the field, but will be better operated by Air Force personnel. Their capability to operate the air-to-air, and air-to-ground missiles, and pilotless aircraft cannot be questioned as they are familiar with the control, electronic switch gear, and instrumentation.

Conclusion

Thus, we can conclude that in the tactical role guided missiles can be used most effectively. They are mainly supporting weapons with specialized missions. In antiaircraft defense against the fast, modern, high altitude bomber, they fill the gap between interceptor planes and antiaircraft artillery. In ground operations, their very presence compels the enemy to disperse his installations with consequent strain on his communication and transportation facilities. The reinforcements they furnish to artillery in respect to range, and to aircraft in respect to weather, more than justifies their development. The future alone will reveal whether or not they will develop into an ultimate and decisive weapon.

World War II established two facts:

1. Operations on sea and land are dependent on air superiority.

2. The fruits of air victory are reaped by the combatant foot soldiers.

The evolution of guided missiles has not substantially altered these facts. Therefore, although navies and armies are not rendered obsolete by the development of these new weapons, they will not come seriously into action unless and until the first clash in the air is over. As a matter of fact, air superiority is a prerequisite even for the use of guided missiles. Aircraft manned by human pilots are indispensable for reconnaissance and other roles where human skill has to take account of changing circumstances and react quickly.

Guided missiles will directly affect ground warfare because:

1. The depth of the combat zone will be deepened.

2. Increased dispersion of troops and material will be necessary, thus dividing large forces into numerous self-contained units which will burden junior officers with extra responsibility.

3. A greater continuity of ground action, regardless of weather, will be assured.

4. As guided missile operations are dependent on large logistic effort, the importance of supply lines and depots will grow as targets.

5. The cost of war will increase as the production cost of these weapons is heavy.

Closely allied with our progress in atomic artillery is our advance in guided missiles, not only the antiaircraft type but the artillery type—surface-to-surface. These missiles can carry either conventional explosives or an atomic warhead. Their all-weather characteristic is most vital to Army operations in the field, and their great range makes them capable of hitting any part of an entire corps front.

General J. Lawton Collins (Ret.)

What Has Korea Taught Us?

Digested by the MILITARY REVIEW from an article by John W. R. Taylor in "Air Power" (Great Britain) October 1953.

Now that the shooting is finished in Korea, military staffs all over the world will be busy studying the balance sheet of this unique campaign. They will find few material things on the credit side. After 1,128 days of battle the front line is nowhere far from the 38th Parallel, over which the armies of North Korea swarmed on 25 June 1950, in hope of a quick victory against their ill-prepared southern kinsmen.

On the debit side, it has cost 140,546 American and 4,451 British casualties alone to preserve South Korea's independence. In the process, 2½ million Koreans have been made homeless and so much of their country has been devastated that President Eisenhower puts the initial cost of rehabilitation at over 2 billion dollars.

Because of United Nations and Chinese intervention on a large scale, Korea has been likened to the Spanish Civil War of 1936-39, which gave Germany, Italy, and the Soviet Union an excuse to test in combat their latest military equipment and aircraft. Such comparisons are completely false, because at no time in Korea have either the Americans or Soviets introduced their latest and most powerful weapons. In the air war the United States Air Force did not use even the early type of *Sabre* jet fighter in quantity until the Communists began to build up their *MiG-15* force on the Manchurian side of the Yalu, with the idea of scoring easy victories over United Nations piston-engine fighters and straight-wing jets.

Similarly, neither side used in action its available squadrons of fast jet tactical bombers or big strategic atom bombers, with the exception of some photo reconnaissance *RB-45 Tornadoes*. The Soviets presumably did not consider that results

would justify presenting United States Air Force intelligence teams with examples of the *IL-28* and other bombers that might be shot down inside the United Nations lines. The United States Air Force did not need to use its jet bombers because obsolescent, piston-engine *B-29 Superfortresses* wiped out almost every worth-while strategic target in North Korea in the first year of the conflict, after which Communist supply bases were out of bounds in "neutral" territory north of the Yalu.

This Communist reluctance to send their *MiGs* and bombers into the battle area, where a damaged plane might be captured, enabled the United States and British aircraft carriers to cruise continuously off the Korean coast throughout the conflict, launching their fighters and strike aircraft in support of the ground fighting, in comparative safety. Such operations would be suicidal in a total war, as would some of the operations carried out by helicopters in combat areas.

Korea was, therefore, in many respects a "phony war," and it is absolutely essential to realize this before trying to learn anything useful from it. It was phonest in the early days, when United States Air Force and Royal Australian Air Force fighter pilots operating from Japan—because airfields were not available in Korea—had breakfast with their wives and children, waved "cheerio" to them from the runway, took off, killed some North Koreans, and returned home for lunch. It became less phony when some pilots did not return; and soon many of the wives were sent home.

It was a phony war, too, because the United Nations Air Forces always fought with one hand tied behind their backs. Their failure to stem the flood of the North

Korean invasion in 1950 and the later Chinese onslaught was regarded by some armchair critics as proof of the inability of air power to play a significant role in tactical warfare. The critics chose to forget that the enemy in Korea was usually an infantry man, moving without vehicles and artillery, at night, carrying only a rifle and a bowl of rice, over mountain trails where the front line was never held long enough to permit proper close air support—and, of course, supplied from bases that, for political reasons, could not be bombed. The critics need only cast their minds back 9 years to the Falaise battle in Normandy for a true picture of the terrible destructive power of close support air warfare against a mechanized army in European terrain.

Fighter "Gadgetry"

Nevertheless, despite its peculiar characteristics that would never obtain in total war, Korea can teach us many valuable lessons. If we ignore them, we shall commit an error as tragic as our failure to exploit, since 1945, captured German devices such as the *R4M* air-to-air rocket which was used with fantastic success in conjunction with the *Ez42* gunsight by the Luftwaffe's crack squadron of *Me.262* jet fighters.

First and foremost, because in any future war the Western allies are far more likely to be attacked than attackers, Korea should have killed the campaign for lighter, simpler first-line fighter aircraft. By this I do not mean there is no room for a ramp-launched, semiautomatic, semi-expendable, piloted target defense interceptor, with a rocket engine to drive it to 40,000 feet in 1 minute and an endurance of 5 minutes. Nor, as I shall explain later, do I doubt the value of lightweight fighters for ground attack duties.

But for fighter-to-fighter combat or interception of fast high-flying or low-flying bombers, the modern fighter needs

every gadget, every piece of radio and radar, every additional ounce of armament that it can carry without prejudicing performance and safety. No expense or effort can be spared to ensure the destruction of enemy raiders, any one of which might be carrying an atom bomb. The result, inevitably, is a big, heavy, expensive aircraft with a big, heavy, expensive engine, needing a highly skilled pilot and hydraulic power boosters to help move the controls at high speeds.

These remarks will raise a scream of protest from proponents of aircraft like the *Folland Gnat*, which has the speed and climb of a *Hunter* on a fraction of the engine power and at a third of the cost. But this is one argument for which Korea has offered an irrefutable answer. The *MiG-15* is lighter, more heavily armed, faster climbing and, in some respects, more maneuverable than the *Sabre*. Yet the *Sabres* have achieved a record of victories in combat better than 10 to 1 in their favor because of more rugged construction, more complex but more efficient radar gunsight, more protection for fuel tanks and pilot, and better pilot training. The Communists have paid in blood for their freedom from expensive gadgetry and high structure weight.

Battling Bantams

Among the bravest pilots in Korea were, undoubtedly, the men who flew the "mosquitoes"—veteran *Harvard* training aircraft, used to locate and mark targets for close support fighter squadrons. They were essential in the early stages of the war, when *Shooting Star* jet fighters, operating from Japan, had far too short an endurance to search for targets themselves. Later, when the jets were able to stay longer in combat areas, the "mosquitoes" were retained because their slow speed enabled them to identify targets far more efficiently than could pilots of fast jets.

The "mosquito" crews suffered many

casualties, chiefly from enemy antiaircraft fire, which was both heavy and accurate. If the enemy had thrown his fighter force into the combat, these "mosquitoes" might have been driven from the air. On the other hand, unarmed *Auster* and *Cub* "spotter" planes have shown on scores of occasions that ability to turn on a sixpence, hedge-hop and land in any respectable size field can often provide first-class defense against fighter attack. A specially designed, easy-to-build, easy-to-fly "battling bantam" like the little *Fletcher Defender* could use these qualities not merely to spot targets, but to destroy them with napalm, bombs, and rockets. There could be no better outlet for the design skill of the light fighter enthusiasts.

Even if the *Defender* type of aircraft is considered too vulnerable for a full-scale war, it would be ideal to meet aggression in places like Korea and Indochina, and for "colonial" warfare tasks such as harassing the Mau Mau in Kenya. The French have shown, with their \$200,000, 680 mile an hour *Baroudeur*, that a high performance jet ground attack fighter can be built simply at less than half the cost of a first-line interceptor. The *Baroudeur* has no undercarriage. It takes off on a rocket-propelled trolley and bellylands on skis. Its designer claims that it can operate from any surface short of a ploughed field, and there seems little reason to doubt him.

Bombers

Korea taught one lesson concerning bombers. In the absence of effective air opposition, piston-engine *Superfortresses* were able to wipe out all worth-while North Korean strategic targets effectively and speedily. When the *MiGs* appeared, it was found expedient for the *Superforts* to disappear—all of which proves how wise is the Royal Air Force's policy of relying on high speed and extreme altitude rather than fire power to protect its new jet atom bombers.

Helicopters

At the other extreme, in speed, operational ceiling and streamlining, the helicopter has earned in Korea its permanent place in the pattern of air power. The United States Marines were able to test under combat conditions their theories on the value of helicopters as assault transport. Entire companies of fully-equipped Marines were flown in 10-seat *HRS-1 (S.55)* helicopters to almost inaccessible mountainside positions in the front line. Days of marching were avoided. Troops arrived in the line fresh. On occasion, telephone lines to headquarters were laid from the helicopters as they delivered the soldiers.

To critics of the helicopter's seeming vulnerability, the Marines will cite examples of missions completed with rotor blades holed by antiaircraft fire. And can there be any doubt that the 90-mile-an-hour helicopter, moving in three dimensions, is less of a sitting target than assault landing craft or trucks moving comparatively slowly in two dimensions? The United States Marines and Army are convinced sufficiently to plan the use of helicopters almost exclusively for short-range transport in combat areas. But it is unlikely that helicopters will ever again be able to operate without air cover, as in Korea, and strong forces of escort fighters will be essential.

Similarly, evacuation by helicopter of some 25,000 wounded—many of whom would never have survived an overland journey—has saved so many lives in Korea that one can only wonder at the apparent lack of enthusiasm for helicopters in this country. Despite their prehistoric appearance, vibration, expense, and complication, helicopters are here, right now, and the sooner we start building them the better, for British helicopter designs are the best in the world.

Equally tragic, especially after the lessons of Korea, is our continued lack of

interest in flying boats. The conflict in Korea was very nearly over in July 1950 before the United Nations was able to organize effective aid for the demoralized South Koreans. With the few usable airfields in enemy hands, our fighters and bombers had to operate from Japan. The only immediate help the Royal Air Force could offer was a squadron of old but superb *Sunderland* flying boats, which needed no acres of concrete from which to operate. In fact, *Sunderlands* remained the only Royal Air Force operational aircraft to see service in the Korean conflict, except for *Auster* "spotter" planes, flown mainly by Army pilots.

The Navy helped to save a delicate situation in the early days and provided air support throughout the conflict by bringing its floating airfields within a few miles of the Korean coast and flying unprecedented numbers of sorties in close support of the United Nations Armies. But if the enemy had decided to throw submarines and bombers into the battle, the carriers would have had to pull out—for until ship-to-air guided weapons or ramp-launched interceptors have been perfected, carriers are still highly vulnerable to air attack. Their main task in total war would be to hunt out and destroy the submarines threatening our seaborne supply lifelines, and for this task, in mid-ocean, they still have no equal.

Fortunately, in Korea, it was possible to supply, also, land-based air support from Japan. But how much better it would have been if squadrons of water-based fighters, bombers, and transports had been available to provide on-the-spot air cover and reinforcements.

In this respect, the fantastic little *Sea Dart* delta-wing flying boat fighter is one of the most interesting aircraft ever built. Its unique hydro-ski undercarriage enables it to operate from rougher water than usual for a small flying boat. Its powerful twin jet engines offer supersonic speed

and help to thrust it quickly off the water. Backed up by a fleet of flying boat tankers and transport aircraft, a force of *Sea Darts* would offer an entirely new concept of mobility in striking power—able to operate almost anywhere in the world at a moment's notice, instead of being shackled to acres of concrete runway.

The United States Navy's Fleet Logistics Air Wing proved the value of transport flying boats with its big 70-ton *Mars* aircraft. In October 1950, at the most vital stage of the war, *Hawaiian Mars* alone flew an average of more than 12 hours a day, every day of the month, carrying up to 133 troops at a time across the Pacific en route to Korea.

Is it not time, therefore, that we in Great Britain begin to show some interest in the superb designs for flying boat fighters, patrol bombers, and transports on the drawing board, before we lose our traditional leadership in marine aircraft? The United States Navy has never stopped ordering new flying boats, and there is no doubt of their value in a total war, when airfields would be priority targets for enemy raiders.

Conclusion

These, then, are the lessons on air strategy and air force equipment taught by this unique conflict. There is one far more important lesson, which has given some purpose to a bitter and otherwise profitless campaign. For the first time a league of nations, organized for peace, has met force with superior force and preserved the freedom of a small country. The United Nations did not fail South Korea politically or militarily, and their support did not, as many feared, result in a third world war. In that fact lies hope for the future—a hope that must be backed up by such overwhelming air power that no nation, great or small, will ever again dare to attack its neighbor. For air power is the key to survival in an atomic age.

Psychological Shock in the Initial Engagement

Translated and digested by the MILITARY REVIEW from an article composed by the various sections of the Society for the Study of Military Science in "Wehrkunde" (Germany) March 1954.

THE first encounter of the soldier with the enemy is for him, as an individual soldier as well as the unit to which he belongs, an unknown quantity. It is an equally unknown quantity to the command, which does not know until after the first engagement, with what combat value it can really appraise the men who compose it. Only after the test of the first engagement is a company really a company or a division really a division. Equally unknown is this quantity to the mind of the soldier who finds himself torn between fear, the instinct for self-preservation, and the manly desire to endure the test.

There can be no doubt that both the individual soldier and the unit, of whatever size it may be, going into their first fight, are in a disturbed state of mind. Who does not know the almost fantastic state of alertness in which every impression operates with double forcefulness and is raised to a higher power before being dealt with by the mind? No one will argue the contention that the soldier, in this situation, has need of his maximum spiritual and physical strength for the difficult establishment of sufficient equilibrium to enable him to endure what is coming.

It can, therefore, be established as fact, that fear and the instinct of self-preservation are the predominating spiritual elements just before and during the first encounter with the enemy, for the overcoming of which, all innate and acquired spiritual and physical strength must be engaged. If the positive forces succeed in attaining even a slight lead sufficient for setting in motion the acquired combat abilities and drilled-in routines, a gradual change-over to normal, rational action will be ensured. If this lead does not exist, then fear and the instinct of self-preservation

will overflow all acquired and drilled-in values and instead of rationally acting men, we find "less than nothing." We see, then, the conditions in full for the production of psychological shock. Shock may be defined as the involuntary reaction of the human mind to fear—fear suddenly aroused and whose cause, as a rule, is not recognizable.

Fear, it may be safely said, is the most primitive effect known to living creatures. It is produced either by optical or acoustical impressions with which, suddenly, the perception or supposition of an actual or imagined danger to body or life is connected.

Such an unexpectedly recognized or supposed danger awakens in the human being, with his driving instinct for self-preservation, fear as the first expression of his agitation. This is one of the crippling effects, for it narrows the world of perceptions, limits the power of thought, and the power of will to the instinctive repulse of the actual or supposed threat and, with this threat, dominates man completely. Especially, when fear mounts to terror and continues on to the extreme limit, illness phenomena may appear, extending anywhere from moderate forms of paleness, trembling, and pounding of the heart, over the entire gamut of illness phenomena, such as involuntary movements of the bowels, loss of control of the limbs, and impairment of mental processes up to the most extreme forms of mental aberration or death by heart or brain failure.

The expression "brainlessness" perhaps best characterizes that condition in which a conscious control of reactions in accordance with the perceptions of the sensory organs no longer occurs, but the person who is a prey to it acts instinctively only,

with the view to preserving his life. Whether or not this action proves favorable for the preservation of life, is another question, which must be answered in the negative.

The susceptibility of different individuals to alarm, fear, dread, or terror varies. We meet with timorous and fearful natures as well as with men who are unafraid and fearless. These are human characteristics which, in the normal medical examination for the determination of the military fitness of the man, are difficult or impossible to recognize. Only by psychological tests of a suitable nature, can they be detected. The subjective disposition of the individual, therefore, plays a more important role than the objective cause of shock and, in this connection, it is especially to be noted that the objective cause for shock and the consequent "brainless" conduct, will always, somehow or somehow, be present in war, while a decisive influence can be exerted on the subjective disposition of the individual man by means of wise measures on the part of the command. The degree of civilization which has been attained by the individual plays an important role in shock. The stage of civilization that has been reached by the Western World has lightened living conditions for the individual man so greatly, guides his life along such fixed paths of conduct, that he is helpless in the face of a direct threat to his life. This threat, however, is the normal situation in war, and in war, there is no police, no fire department, no technical aid that one, as theretofore accustomed, can call upon. In the final analysis, however, the mental and spiritual constitution of the individual men who, together, make up the unit, is more decisive in the matter of the susceptibility than all material influences. A unit is composed of the average people of the nation—of laborers, of city dwellers, of men from the rural districts—spiritually depressed, apprehensively fearful

men of weak courage, whose highest ambition is the security of a comfortable, modest existence, whose concept of sacrifice and duty ends at the threshold of their dwelling or, at most, at their place of employment.

According to the view of psychiatrists, other, deeper-lying uncertainties may also contribute. All the natural aggressive inclinations of the individual are suppressed from childhood on. The child who forcibly takes a toy away from another child is scolded, and later on, social and religious "don'ts" enter the scene. Suddenly the young man is stuck into a uniform and told to fire on other persons. Here inhibitions of a moral type operate which especially favor shock. Finally, we have also the sensational description of the illustrated periodicals concerning the nature of the effects of modern weapons together with their posed and retouched photographs to consider, which do not fail to produce their impression, especially on a young person—impressions which are revived the moment he steps within range of these weapons.

Preparedness

All these men, thus influenced and inhibited, are now taken in hand by the laws of the state and forced to take up arms, regardless of whether they are physically ready for it or not.

As long as shock of this sort remains confined to scattered individuals, it may be successfully dealt with by wise action toward the men affected—if necessary by their removal from the unit. It is, however, contagious, like the cholera epidemics of former ages, and can transform itself into a mass effect at an astonishing rate depending on the susceptibility of the remainder of the unit. This will spread to the entire unit as mass panic which, in a very short while, will transform the unit into a mad mob resisting all efforts toward control from without.

This spells the end of the unit, as far as combat worth is concerned and, what is still worse, such a unit becomes a threat to all other troop units in its vicinity.

Historical Examples

Military history contains numerous examples of shock of various kinds produced either intentionally or unintentionally, such as the impression produced by Hannibal's elephants on the Roman legions, the superstitious terror of the Mexican Aztecs produced by the "terrifying horses" of the Spanish *conquistadores*. The introduction of all new combat means in more recent times, such as firearms, poison gases, massed armor in attacks, the atom bomb, gave rise to shock in the ranks of the enemy. All this constitutes evidence in support of the contention that the surprise employment of new weapons, especially in the present, highly technicalized period, is of especial significance in the production of shock that will be of decisive influence in campaign or war. How impressive the appearance of even a known weapon can be when it appears with highly augmented combat worth, was quite apparent to the Germans on the eastern front, experienced though they were, when in 1941 the Soviet *T-34* tanks first appeared. The first appearance of the atom bomb, through its shock effect on the enemy command and the entire nation, brought about the end of World War II.

Tactical measures, and unexpected movements and heavy fire against flank or rear, against forces on the march or resting, are able to achieve results derived partly from shock.

The effects of such shock on the individual soldier or unit embrace an entire gamut of phenomena. To be able to recognize these, especially in their initial and frequently indiscernible appearance is, for the actual troop commander, the company, or battalion commander, especially important. It is a fact that military lead-

ers have seldom occupied themselves with any degree of thoroughness, with the subject of shock, the panic which results from it, its causes and the methods of combating it, although it was and still is well known to the soldier. But what commander enjoys the discussion of this subject which is often synonymous with the surrender he has gone through on the field of battle.

Passive Attitude

Starting with the fact that as shock begins to develop, conscious direction of reactions in accordance with the perceptions of the sense organs disappears, and instinctive reactions from the subconscious take over, then it follows that the human creature in such a situation conducts himself, principally, without sense or reason. He acts in a senseless manner for the reason that his instinct is not oriented, in advance, concerning the facts of the modern atom bomb or massed armor attacks. Only his desire to conceal himself is to be evaluated as a correct reaction to the situation. Out of this, it is possible for rational action to emerge. If it gives rise, however, to a general passivity of concept, to resignation to unavoidable or, at least, seemingly unavoidable fate, irrationality will then have entered into a situation which, generally speaking, can be overcome only by an active, carefully weighed course of action. Military delinquencies, such as refusals to obey commands in order to escape active participation in an operation, are born of this brainless passivity. It is clear, that an organization which is prey to it, possesses no combat worth whatever when surprised by the enemy with an active operation.

But there are milder forms of this passive attitude such as the slowing down of the march tempo; the pretense of sudden sickness; the lagging behind of individual soldiers; taking cover too often and for too long; the movement of many sound men to the rear along with the wounded,

allegedly for aiding the latter during evacuation; failure to use weapons in combat. All of these detract from the combat worth and effectiveness of a team which is organized for combined action.

This mild form of passive conduct is characteristic of a unit going into its first fight. Characteristic of it also, is an opposite form of conduct in which the action of individuals or of the entire unit, is nervously speeded up until a state of extreme nervous tension is reached. This is recognized by irrational firing which is extremely difficult to halt and which often leads to retaliatory firing by the enemy.

These completely opposite phenomena associated with incipient shock make it difficult for troop commanders to recognize signs of its development. In this condition, often only a slight provocation is needed to set off mass panic—for example, a burst of artillery fire which does not even need to strike its target, or an attack by low-flying aircraft.

Surrender without resistance, or the initiation of sudden movement to the rear which cannot be halted, may be the result of this mass panic. A less evil result is a rush of the forces forward to lay hands, as it were, on the enemy. Such a reaction will often end favorably, it is true, but will result in losses which might have been avoided with rational action. The saying that "he who runs, dies," is as true as it is an imperative law for combat forces. One evidence that the human instinct is not adjusted for many features of the modern field of battle is that massed, panic flight such as this on the field of battle, will nearly always lead to the death of those participating.

External Provocation

How small an external provocation is required for bringing about shock is evidenced by the following example from the last war:

In September 1939, in Poland, the German 17th Regular Division went into battle for the first time. The division commander was with the vanguard regiment which was just deploying for combat. When about to continue the advance, the division commander called for the motorcycle messenger who accompanied him, and who answered to the name of "Glas." The call was mistakenly passed along as "gas," which caused great uneasiness among the men which was not easily quieted.

We call this example somewhat inapplicable for the reason that it was not enemy fire at all that was involved here. Merely through a misunderstanding, however, a possible danger was indicated against which, as a matter of fact, these regular forces were well trained and equipped.

The last and most serious result of shock can be mutiny on the part of the forces affected by it. By determined action and force of arms, they will attempt to reach a place of supposed security. Serious shortcomings on the part of the command are regarded as the reason for such occurrences.

As a special example of this may be cited the mutiny in the French Army in 1917 which, as a result of General Nivelle's unsuccessful offensive, had been obliged to suffer such heavy losses that the resulting shock caused entire divisions to mutiny—in this case, to refuse to go into the trenches. It speaks for the very high order of the psychological leadership of Marshal Pétain, who succeeded in command, that this shock was halted, although not until after General Nivelle, who had been the cause of it, had been relieved. The motive for these decisions is essentially the same as that announced to the troops. In addition, however, there are motives resulting from exaggerated reports of all natures which, at the moment, cannot

be checked. The subjective susceptibility of the commander plays a very important role here.

We have said that passivity or irrational action in many different forms are the consequences of shock. If, however, the military command gets into this condition, its decisions and their execution may be very disastrous to the unit. It is obvious from this that before an individual is chosen as a commander, it must be determined whether he is of the timorous or the fearless type, for only the latter is suited for being a commander making decisions of life and death important to his men. Here, psychological tests will aid in selecting the proper type.

In the foregoing, we attempted to determine the cause and the effects of psychological shock on a unit going into battle for the first time. In the following, we shall deduce from what we have learned, what countermeasures of a remedial nature are necessary for preventing such shock, for mitigating it, or for dealing with it.

Counterremedies

American psychologists made serious efforts during and after World War II to learn the reasons for the occurrence of shock, from the psychological point of view, and to discover corresponding counterremedies. The fighting in Korea offered them the opportunity to attack the problem from the practical, almost the statistical point of view. Among other things, they attempted to determine who, why, and how many do not make use of their weapons in battle. We know also from press reports that American military leaders desire to familiarize their troops with the effects of even the heaviest weapons by permitting them to take part in atomic tests.

From the German side, we are familiar with the "psychological test" of the pre-war period which was intended to test the

specialist candidates (radio men, aviators, and others of this type) for their special fitness or, for example, the young men intended as officers, for their general fitness. In each of these, the subjects were tested, it is true, with respect to their capacity for quick reaction to unforeseen occurrences, but not with respect to their susceptibility to shock. From these tests, it could be recognized whether one had before him a timid or a fearless man. More should certainly be done in this field in the future, for the fearlessness and cool-headedness of the commander, must be such as to render him capable of successfully combatting panic when it occurs in his unit. An officer will not only have to take action of the proper nature against incipient panic in acutely dangerous situations, but he must wisely prepare his men to resist it, by giving them appropriate training. It requires a great deal of imagination to accustom the forces entrusted to him to all dangers that can possibly arise.

We have pointed out that shock results from fear aroused by unexpected occurrences which are regarded as a real or presumed danger. The effort must be made, therefore, in training, to accustom the soldier to all possible dangers of the field of battle so that these, at least, cannot present themselves suddenly and unexpectedly as dangers heretofore unknown. Since the fear which gives rise to shock is produced generally through optical and acoustic perceptions, the soldier must be familiarized during his period of training with all the optical and acoustical phenomena of the field of battle. The participation of American troops at atomic explosions is entirely in line with this idea. Not only is the normal participation in exercises with live ammunition necessary, but in addition special exercises to acquaint the troops with the weapons used should be employed. The troops should advance behind a rolling artillery barrage, under

overhead artillery fire, be acclimated to fire of rockets and infantry weapons coming from friendly as well as enemy lines, be accustomed to fire from tanks, dig foxholes and have tanks roll over them while they, the troops, occupy the foxholes, and finally should be subjected to heavy artillery and rocket fire in deep shelter trenches.

Acclimation to the material effects of air attacks of all types with the dropping of live bombs and strafing from aircraft weapons is more difficult, for the effects of aviation weapons are difficult to hold within the necessary security limits required in training. Nevertheless, even here, everything possible should be done. So-called combat under unusual conditions as, for example, at night, in fog, and in woods, must be completely familiar to every soldier.

Even the age-old effects of the battle cry is to be considered. No veteran of the eastern theater will forget the deep-acting effect of the thousand-voiced "hurrah" of the Soviet regiments. Even here, familiarization exercises could be used as well as adopting a powerful "hurrah" for one's own units. American psychologists even maintain that this battle cry sets off a chain reaction and transforms lambs to lions on the field of battle.

We made the assertion at the beginning of this article that in the unstable condition of every unit before and during its first engagement, it has need of the highest morale and the greatest physical vigor to be able to overcome natural fear and to be able to put into play its acquired combat ability and drilled-in combat routines. This is based on the assumption that these combat abilities and combat routines exist and are so thoroughly ingrained in every soldier that he exercises them subconsciously. It makes no difference whether he is concerned with a purely mechanical object as, for example, the starting of a motor, the driving of a tank or other

motor-driven vehicle, the loading and firing of a rifle, or the more difficult functions such as the operation of complicated sighting apparatus, signal communication equipment, or automatic weapons. Nor does it matter whether the soldier is about to perform a particular combat disposition such as the formation of a file or line of riflemen in conformity with the situation, or the driving of a tank into the place assigned to him in the attack wedge, or the shifting of a weapon to a suitable and tactically correct position—all this can and must be drilled into the soldier as routine. As paradoxical as it sounds, the military training must rid the man of the enervating effects of modern civilization. The young man coming out from under the protecting roof of his dwelling and other structures, must again become accustomed to nature, must learn again to live and fight day and night, in fog, in rain and storm, in forest and moor, and swamp, in heat and in cold. None of these natural influences must affect him and make him susceptible to sudden fear often aroused by so trifling a thing as the cracking of a dry twig in the adjoining forest area.

To the field of acquired combat abilities belongs, also, the drilled-in scheme of command data and operations which must be known and executed by the commander.

We knew our enemy; the units adjoining us; our intention (implying our decision—for they were identical); the manner in which our intention was to be carried out; our reconnaissance; our special weapons; the location of our first aid station; and the place where the commander was to be located.

This scheme is like an armored shield around the deliberations of the commander, protecting him from weapons effects, from rumors, and the panic-producing influences about him. This drill has nothing to do with that of the drill ground, which now has become superfluous. If, however,

the subconscious, under such conditions of terror, comes out with the drilled-in routine of combat, shock and all its effects can then be overcome.

The anticipatory measures thus far discussed, have pertained more to the soldier's practical, material, and routine activity. The preparation, however, of the basic spiritual attitude of the individual soldier, as well as of the unit for the terror of a modern war, is also of decisive importance.

Basic Requirements

This basic attitude may, in exceptional cases, be present in a positive sense and frequently even in large troop units. We may cite here the large voluntary units of the German Army in 1914, when in the fall of that year, these, organized into three army corps, went into the battle in Flanders. These units were lacking in everything that has thus far been mentioned in the way of material preparation and routine training against shock. Nevertheless, they represented the highest order of manhood Germany had at her disposal at that time. When these units went into the battle on the plains of Flanders, there occurred, however, no panic, no shock, and the impetuosity of their attack was halted only by the hail of lead from the English and French machine guns. As the German national anthem died away on their lips, "they themselves died, as the law had decreed it."

But this must be regarded, today, as no longer possible. The picture that we have already drawn of the small-minded, timorous, "little man" who, even in peacetime, is greatly frightened by the sensational news appearing in the daily press, seems more to fit the pattern of the natural basic attitude of the masses, than that of a sacrificial faith—which is no longer found, except in the case of rare individuals.

And yet, it is our task in training to

awaken in masses of these very individuals, these timorous, indifferent, or obstinate individuals with little faith in themselves, a feeling of their own worth and manhood, to explain to them the why of the thing, to get them to understand the necessity for eventual military and soldierly operations and, finally, to arouse in them, confidence in their command, their own branch of the service, and confidence in their superiority.

This very confidence in his own command and in the superiority of his own weapons increases the self-confidence of the individual man. The same is true of the entire unit. It is also the only deterrent effective against an eventual adversary who is already known to be given to brutal methods of warfare. This must be designated as an irrational load factor, since its point of origin lies with the enemy, and the European soldier, particularly, with his traditional concepts of knightly methods of warfare—although they often are present in the subconscious mind only—is especially sensitive to the practices of a brutal opponent.

This sensitiveness will operate in an especially depressing manner on a unit going into battle against this adversary, and render it vulnerable to fear and shock in its first combat contact, particularly if this adversary acts with a great deal of energy in his attack. This self-confidence must, therefore, be especially fortified in training by the citing and discussion of how other units in clashes with this same adversary overcame these obstacles and won the upper hand over him. Such an example follows to show the approximate manner in which these examples are to be used.

A newly formed division had to relieve another division which was in the front line. One of its regiments was to occupy a sector which was not to be organized for defense until after a successful attack had been conducted. By nightfall, one

battalion, which had been in the lead, had reached and gone into the line; the other two battalions were still on the way. The regimental staff was already in its position behind the first battalion and had assumed command over the sectors which were still to be relieved. The neighboring forces on the right were over a half mile distant because of a stream along this portion of the front which was impassable to tanks. On the left, until nightfall, no contact had as yet been established with the friendly forces. In this situation and at this moment, a massed enemy infantry attack without preparatory fire, hence, with complete surprise, hit the entire sector. The shouting masses of enemy troops surged past the regimental headquarters where the staff, seizing their weapons, defended themselves valiantly against the enemy. The enemy forces poured on into the gun and antitank cannon positions and fell upon the trains. The wild firing lasted through the entire night with the intermixture of enemy and friendly forces complete.

From the noise of the battle it could be discerned, however, that the lead battalion, which had gone into position in the line, in spite of having been bypassed on both sides and penetrated by the enemy forces, was still fighting. The men had maintained their nerve, had quickly formed strong points, and had defended themselves on all sides. As a result, the situation was mastered and completely reversed. The enemy was confused in the night attack, and became engaged in combat on unknown terrain. Caught in a pincers maneuver at dawn by the two battalions which had been approaching during this time, the enemy forces were completely annihilated. More than 600 enemy prisoners were taken, from whom it was learned that the attack had been made by an entire three-regiment division.

From such an example with a little imagination on the part of those in charge

of the training of the troops, a great deal can be learned that will be of use in training and the broad field of shock can be discussed and drilled in on the basis of practical experience. Portions of the examples can possibly be used as exercises. The lessons that must be learned from such examples are that confidence, combat discipline, and coolheadedness bring victory even under difficult conditions, while shock, on the contrary, brings defeat and death.

Discipline

Of all prophylactic measures, discipline is of particular significance. Examination of all historical examples teaches us that the side which was best disciplined, accomplished most and won the victory, as long as other factors were equal. The instilling of discipline will ensure that the soldier will automatically subordinate his own interest, in almost complete mastery of his own self, to the interest of the whole. The more strictly a unit is disciplined in this direction, the more quickly and resolutely will it neutralize its reactions to fear, which possibly could bring it into a condition of incapacitating shock. It must not, however, be merely the compulsion of a military system which moves the soldier to submit to discipline. The more willingly the discipline is borne by the individual, the more effective it is, especially when this willingness is supported by a knowledge of the reason for the fighting.

We may distinguish the following separate categories of discipline:

1. The disciplining of the mind with the aim of training the soldier in the maintaining of mental composure by means of carefully chosen and prepared forms of surprise and deception.
2. The disciplining of the body with the aim of fortifying it for holding its own against recurring physical reactions to possible shock.
3. The disciplining of the individual, as

such, with the aim of absolutely compelling obedience, even in cases where the individual is under great strain and his courage is most severely tested.

4. Finally, the disciplining of the combat unit in the framework of which the individual is forced to endure shock, with the aim of building out of individuals, a community which is capable of combat—a troop unit.

Considerable importance is also attached to weapons equipment. Nothing is worse for a unit going into battle for the first time than to be pinned down for hours under superior enemy fire without being able to defend itself because of shortage of weapons.

Composition

The organizational composition of the new unit is also of great importance. Its admixture of battle-tested men and experienced command personnel, may be very decisive in the matter of its behavior in its first engagement. The example of the veteran fighter has a calming and encouraging effect on the troubled minds of the new men.

Also, uniform composition of the unit from the point of view of locale of origin, operates in a fortifying manner on the individual. The presence of another person who is a neighbor in one's own village, an oath uttered in one's own dialect, or a bit of wit at a troubled moment can be more beneficial than the strictest command or the personal example of the most spirited commander. Also, no one willingly will give occasion for the report, in his home village, that he somewhere and at some time did not conduct himself in an altogether heroic manner.

The matter of the medical service also demands special attention in this connection. This would appear, above all, to be a question of the proper selection of personnel. The medical men of the company and medical officer of the regiment, partic-

ularly, need to win the confidence of the men. When the soldier knows that he will not be left helpless by the men of his medical detachment when he is wounded, and that these men are really able to help him, he will face danger under less tension. To the prophylactic measures belong also the medical surveillance and care of the command personnel for the maintenance of their mental and physical capacity for enduring strain, for correct command decisions suited to the situation, and their consistent execution. This can prevent the unit from getting into situations which will be sure to produce mass shock.

If it has been possible to carry out successfully the prophylactic measures mentioned in the training, organization, and selection of the command of a unit, there will still remain several points relative to command, that should be taken into account in leading a new unit into its first battle.

The first engagement of a unit should be so handled that as far as possible the chance for surprise by the adversary, whether by means of weapons effects or by sudden and unexpected attack, will be eliminated. The possibility of such a thing is to be found in extremely thorough reconnaissance and its accurate evaluation by the troop command. Included also in this reconnaissance are security measures, especially during rest periods and when on the march, in which connection, the anti-aircraft observers play a particularly important role. One of the most important measures is that of combat reconnaissance by the unit itself. Proficiency in this should have been acquired by drilling. During this training, there should be no situation, no exercise, no drill, no war game, in which reconnaissance and security, from strategic down to the last form of combat reconnaissance, are not dealt with, practiced, and criticized. Naturally, the type stressed will vary. A company, for example, will place its main stress on combat

reconnaissance. Reconnaissance is protection against surprise and, consequently, against fear and shock.

The physical and mental condition in which a unit meets the enemy, may also be influenced in a positive manner immediately before the first encounter. A rested unit fights better than an overtired one, hence, there must be no nervous driving of the unit as it advances to meet the enemy. A unit going into battle in the morning after a long and exhausting night march without sufficient rest is already half beaten. Even modern motorized forces are not immune to fatigue after long marches. Everyone knows how tiring a long night journey by motor vehicle is, even though he may not be seated at the wheel.

The unit should be given only commands and missions it is able to fulfill. In engaging its unit, the command must correctly judge how high the capabilities and combat ability of the unit is at this moment, in comparison with those of the enemy. Over demands on the unit may easily be paid for by shock of the worst nature. Finally, the command should do everything possible to make the situation simple for a new unit going into its first combat. As far as possible, the fight should be conducted along the lines the troops have practiced many times in exercises. When the situation is especially difficult, the troops should have the aid of heavy weapons. Above all, however, there must be no nervous driving of the unit.

In the battle, the example and influence of the commander is decisive, especially, that of the lower command personnel who still possess influence over the individual soldier. Experience, fearlessness, cool-headedness, and quickness of decision, must characterize squad, platoon, and company leaders if they are to act as examples.

The indirect influence of the higher commanders is also important, the full

confidence of the men being influenced by the commanders of the battalions and regiments whom they may designate as the "old man." The young soldier, under the trying impressions of his first fight, must be able to place his confidence in these men. They must radiate the strength on which he will be able to hold out. For this reason, all commanders belong up front as much as possible, not for tactical reasons alone, but in order that they may be seen and set an example. Over the telephone alone, no battle has yet been won, but has often been lost for the reason that the unit was thus deprived of the benefit of a helpful example. Every fight has its crises which must be overcome through the all-out effort of all the commanders, drawing their men through example and influence after them.

The more a commander meets the requirements of his mission and sets the proper example for his unit, the more serious the effects of his loss in battle, especially in a difficult situation, with respect to the morale and stamina of his unit. Quick, resolute action on the part of the commander next in rank may save the situation and prevent severe shock. There are, however, situations in which such a unit has to be pulled out of the battle at the first opportunity.

Another necessity in the first battle is an employment of weapons on a par with that of the enemy. Lack of artillery and air support, especially when the enemy possesses it in abundance, is extremely risky in reference to the actions of the unit, not only because of its material effect, but also because of its effect on morale. Finally, in modern battle, we have the extremely serious effect on morale produced by the massed armored attack. Even though the defender may have the best countermeasures available, there is always the instant of terror for the man who finds himself facing one or more of these monsters. This initial terror must

be overcome, otherwise, panic and the greatly feared paralyzing terror produced by the encounter with tanks, will result. In this situation, the conduct of the commander, of whatever rank he may be, who first sees the tanks, is decisive. Thus far, actual atomic weapons constitute an unknown, but in spite of this fact, it should be possible to overcome the terror produced by them the same as that produced by the heaviest destructive fire of the artillery or the bombing attacks by planes.

Countermeasures

In spite of all these measures, however, a new unit will most often have moments of uncertainty during its initial engagement, moments of uncertainty in which the commander must be able, almost intuitively, to detect incipient shock. To act promptly in such a case is the first duty of every commander. The choice of countermeasures is just as varied as are the causes of shock. Many times all that is needed is a hearty oath or a bit of dry wit to correct the situation. A vigorous reprimand can be just as effective in more difficult cases as friendly counsel under other circumstances. The commander must have an intuitive feeling for the choice of the means to employ, based on a knowledge of his unit and each individual. A commander who is unknown to the soldier and who intervenes in a crisis, is able to influence the soldier, generally, only by his example.

There are, naturally, cases in which all normal means are of no effect whatever. In such cases the use of weapons is justified when, by deliberately shooting a single person, an entire unit will be protected from destruction into which it perhaps would be led by mad flight. It goes without saying that a commander must have certain legal grounds for such action. Moderation in the use of weapons is particularly necessary; frequently only a resolute threat suffices. When all these means

do not suffice and entire portions of a unit are seized with shock, then rapid withdrawal of the affected unit from danger and its relief are indicated. It is well to meet it at buffer positions in the rear, already occupied by other units and, subsequently, to give it sufficient rest. Abundant rations, mail from home, possibly quiet discussion of the situation from which the shock arose, are means for restoring the unit to normal effectiveness.

Experience teaches that a good unit recovers relatively rapidly, even from severe shock. The conduct of the XVII West Prussian Army Corps in August 1914 in the battle of Gumbinnen against the Russian First Army is an example of this.

After an exhausting night march, the Corps, after inadequate combat reconnaissance, ran into strong Russian defense positions and attacked with the spirit common to the German Army of 1914, without waiting for artillery support. Extremely powerful and sudden fire from unexpected Russian positions, halted this spirited attack, resulted in heavy losses, severe shock, and ensuing panic phenomena on the part of the unit which was closest to the enemy. The commanding general of this Corps, Field Marshal von Mackensen, broke off the fighting and removed his forces from contact with the enemy in a long night march. Three days later, this same Corps, after further strenuous marches, as a left-wing unit of the Hindenberg Army, fought the battle of destruction of Tannenberg and, after breaking deeply into the enemy front, completed the encirclement of the Russian Army. Here, severe shock on the part of a new unit going into its first battle, was halted by the proper measures on the part of the commander and the inner spirit which animated the German Army of 1914.

In our modern Western Armies, however, which are estimated to be much more susceptible and vulnerable to fear and shock, medical treatment along modern psychi-

atry lines, will be of great value, especially when it concerns individual soldiers who, in the midst of an otherwise unaffected unit, succumb to fear and shock. The experiences of the Americans in Korea are especially noteworthy. There, soldiers affected by shock were not moved far to the rear, but treated by psychiatrists at the first-aid stations and collecting centers for wounded—generally with such excellent success, that they could be returned to their unit in a relatively short time. It is likely that sufficient rest and sleep were also important factors in their restoration. It may also be necessary to break up entire units after severe panic.

Conclusion

We have seen that every engagement and every battle has its crises, which must be overcome by command intervention, whether it be by the exemplary conduct of the commander himself in the fighting, or by measures put into action by the commander in the tactical or operational field.

The command will attempt to get every man available into the fight on the field of battle. Incidentally, the command will not balk at improvisations, and may be forced to employ them. All too often, then, under the compulsion of pressing need or when fighting to gain time, soldiers who

are less suited for combat and are inadequately trained will be used to form units such as the "alarm units" of World War II.

Both sides, in the great Eastern Campaign of World War II, made use of these so-called "alarm units," but looking back on it, it must be said that many times they were merely sacrificed without ever achieving the aim of their usually overhastened engagement. These so-called "alarm units" are especially susceptible to shock and, as a rule, they were destroyed as a result of panic breaking out in their ranks when they were in very difficult situations, for, naturally, they were always thrown into battle at the decisive point. It is the command's duty to foresee and avoid such sacrifices and when such an engagement cannot be avoided then to assign to such units only minor missions which they will be capable of fulfilling. At the same time, a thoughtless splitting up of trained combat units, is to be regarded as a sin contrary to the spirit of warfare, because among all the other disadvantages, it can favor the development of shock.

It is a strange thing about the irresolute human heart in the hour of danger: only great, self-mastering bravery is able to seize a firm control over it and enable the man to stand firm before the enemy.

Great leadership is a priceless military asset, and the lack of it can never be offset by numbers of men, by a preponderance of guns and tanks, of planes, bombs, ships, or any other material things, no matter how good they may be, how modern, how powerful. No matter how large and well-equipped it may be, a military force which goes forth to battle without fine leadership—not only at the top but all down through the ranks—marches toward defeat and disaster.

Secretary of the Army Robert T. Stevens

Tactical Atomic Support of Ground Forces

Digested by the MILITARY REVIEW from an article by Lieutenant Colonel P. J. Wilkinson, in "The Journal of the Royal Artillery" (Great Britain) April 1954.

THIS article is in no way a scientific review; current atomic jargon has been scrupulously avoided. In drawing attention to the practical problems of the subject, and suggesting solutions to them, the writer is expressing entirely his own views. In doing so, his aim is to promote study and discussion of this military problem, among present and future officers of the field army, especially of the Royal Artillery, who may find themselves called upon to use tactical atomic support at short notice.

Protective, passive, and evasive measures of defense against atomic attack have been the subject of several military publications and recent press articles. The doctrine of what to do if you are at the receiving end of an atomic attack is already formulated and has entered the field of unit training.

In contrast, there is a marked lack of doctrine in the tactical use of atomic missiles in active defense, attack, and counter-attack. The distribution of such directives as have been published has not been scaled down to artillery commanders in lower formations, nor to the regimental commanders they support.

Need for Guidance

If this lack of guidance is due to the needs for secrecy and security, it is time a working compromise was reached. Now that the Soviet Union is known to have an atomic stock pile and the American atom gun has been demonstrated to a public audience in Europe, is not secrecy, to some extent, the enemy of technical progress by the users? It would be of no avail to possess superiority in tactical atomic missiles capable of halting the aggressor army, if our armies and air forces fight-

ing the battles did not know how to use them. It takes time for units to perfect their organization for, and to acquire skill in, using new weapons and tactical doctrine. It might take the field army and tactical air force as long to acquire organized skill with tactical atomic missiles as it took the Germans, and later the allies, to acquire skill in the use of armor in mobile warfare. Such time is measurable in years. There is, therefore, all the more urgency for the doctrine to be formulated and disseminated down to unit commander level.

Basis of Study

The strategic use of atomic missiles is outside the scope of this article nor is this the place to develop the case of atom bomb *versus* atom shell. Information available at the time this article was written indicates that science has not yet mastered the problems of identification of target, aiming the missile, and flying, in all types of weather. The tactical air force cannot reasonably be expected to produce an atom bomb at any hour of the day or night, in any weather or visibility. In the case of the atom gun, it may not be possible to deploy it within range of the proposed target, or to complete its technical preparations under hostile air attack. Neither aircraft nor gun can, therefore, be relied upon as the sole source of tactical atomic support. It follows that both sources, complementary to one another, are required.

For the purpose of this study, therefore, four main assumptions are made:

1. The available means of delivering tactical atomic missiles will be:

Atom bombs—carried by aircraft of a tactical air force.

Atom shells—fired by a heavy artillery or naval gun.

2. Atomic missiles delivered by these means may be fuzed to detonate in one of four alternate ways:

Air burst—at a predetermined height above the target.

Ground burst—on contact with the target.

Underground burst—after penetrating the target.

Underwater burst—in water of sufficient depth, under the target.

3. There will be sufficient stocks of atomic missiles to permit a corps to have a call on a number for battles which the army group commander considers vital.

4. Political authority to use atomic missiles has been obtained.

The Problem

Shorn of all frills, the problem confronting us is to achieve the best organization and control of tactical atomic resources in the field, for ensuring quick and effective response to demands for tactical atomic support.

This central problem may be split into four subsidiary questions:

1. What should be the arrangements for the allocation, command, and control of tactical atomic resources in the field?

2. What factors govern the selection and priority of targets for tactical atomic attack?

3. What procedures should be used for demanding tactical atomic support?

4. What effect will the use of tactical atomic missiles have on military tactics?

Let us now proceed to examine these questions in greater detail. We will start by eliminating the minor problems of which service, or arm of the service, should be responsible for tactical atomic units.

The tactical atom bomb.—This will be delivered by aircraft of the tactical air force. It is clearly an air force responsibility to provide, command, and control the

units holding stocks of tactical atom bombs in the field, and those operating the aircraft which deliver those bombs to the target.

The tactical atom shell.—The 280-mm American atom gun is reported to be a perfectly conventional heavy artillery piece, capable of firing both conventional and atom shells.

The firing, by indirect methods, of a large shell to hit a target at long range with a given degree of accuracy, is a typical and traditional gunnery task of the Royal Navy and of the Royal Artillery, respectively. The contents of the shell (including atomic contents) affect only the selection of targets, timings, fuzing, safety precautions, and any special measures to ensure secrecy and surprise.

It would, therefore, seem logical for part of the conventional heavy units of the Royal Artillery with a suitable modified establishment, to become the atom artillery of the field army, and that it should be under the operational command of the Brigadier Royal Artillery, or the Commander, Corps Royal Artillery, of the formation to which allotted.

For amphibious operations, it should be possible for tactical support to be provided by atom shells fired from naval guns.

Allotment in Support

In deciding the allocation within a theater, tactical atomic missiles should be treated as a normal vital munition in short supply. The principles remain unchanged. A reserve of stock must be ensured both at the theater level and at the command level to which allocated. Some initial allocation of theater stocks might be made on intelligence forecasts as to where and when hostile concentrations would occur. But the main allocation would probably wait until the opening moves of a war had revealed hostile intentions, objectives, centers of density, and mass.

Sooner or later, probably no less a person than the supreme commander or his deputy, whoever is directing over-all military operations, must decide the allocation of tactical atomic missiles to each front or territorial sector. Once theater stocks are allocated, the command and control of tactical atomic resources allocated must pass to the highest subordinate military commander directing the operations in which the atomic missiles will be needed. Let us assume that initial allocation will normally be to army groups. It would then be normal for army groups to give a corps a priority call on a specified number of atomic missiles for a critical phase of its battle. Similarly, in exceptional cases, corps might give a division or independent brigade group a priority call on a number of atomic missiles to support them in a particularly vital local battle. The containing of an enemy bridgehead in defense of a river obstacle might well come within this last category.

If this suggested system of allocating tactical atomic missiles under command and on call proves correct, every formation commander from army group down to brigade level, and every artillery commander from Brigadier, Royal Artillery, to the commanding officer of direct support field regiments, will need sufficient knowledge of the effect of tactical atomic missiles and the procedure for demanding and controlling their use to enable him to employ them to the best advantage in support of any operation. It follows that gunner commanders and their staffs at all levels, in order to carry out their task of co-ordinating all types of fire support, must have adequate, detailed knowledge of the following points concerning tactical atomic missiles:

The effects, of each type of burst, for each size of atomic missile, in terms of destruction of personnel and material. The degree and duration of neutralization likely to be effected. Proportionate effect

of flash-heat, shock, blast, and radiation on targets selected.

The safety factors, for our troops, in terms of safe distances from "ground zero" for various types of atomic bursts, combined with the degree of protection afforded to our troops by the cover available to them. Separate safety factors will be required for men dug in, or in armored or unarmored vehicles.

The follow-up action. How soon after atomic attack can our troops move across the target in tanks, armored personnel carriers, trucks, or on foot?

The delay in response. How long will it take from "demand" to "target" for an atom bomb from the atom artillery in any given circumstances?

These factors must be as well known to us as are those concerning conventional tactical air support, or heavy artillery support.

Suitable Targets

To approach this question realistically, let us consider what would have been the outcome of certain operations of recent wars if both sides had possessed and used even one 20 kilo-ton atom bomb on each of the following targets. In considering each case, ask yourself whether the operation could have been undertaken at all; and if undertaken—with what prospect of triumph or disaster.

The examples shown on page 105 are only a small group, chosen at random. A similar list covering the Soviet-German fronts would be longer, and even more convincing for those who were there. Even brief contemplation of these listed examples opens up fields for unlimited discussion and speculation.

Definitions of a tactical atomic target.—The examples shown on page 105 serve to indicate what are worth-while atomic targets. These divide themselves into two main types: targets for destruction and targets for interdiction.

Targets for destruction.—The dominant

<i>Target</i>		<i>Type of Atomic Attack</i>
Dunkerque Beaches	—1940	Air burst
Pearl Harbor	—1941	Underwater burst
Singapore	—after British evacuation of Malaya	Air burst
Stalingrad	—on Soviet defenses, just before their counterattack	Ground burst
Stalingrad	—on encircled and compressed German VI Army	Air burst
Malta	—at any critical moment 1940-1943	Ground burst or underwater burst
Tobruk	—first stage	Air burst
Alamein	—British armor passing through own infantry and mine fields	Ground burst
Alamein	—concentration of Axis armor and antitank guns opposing us	Air burst
Japanese or American Pacific beach-heads	—in any of the opposed landings, such as Solomons, Tarawa, Okinawa	Air burst on land defenses, underwater burst on shipping
Majors ports of Great Britain	—any of the major ports on the east and south coasts just before the invasion of Europe	Underwater burst in the harbor
D-day Normandy	—invasion fleets at anchor	Underwater burst
Caen	—sector of allied bridge-heads after the buildup	Air burst
Seine crossings	—30th Corps concentrating to cross 43d Division bridges 1944	Ground burst at bridge sites
Rhine crossing	—British concentration of artillery and bridging—Wesel	Air burst over gun areas and bridging parks
Pusan	—when United Nations Forces had withdrawn to tight perimeter	Air burst

factor is density. The ideal target under this heading is one having an abnormally high density of personnel, supplies, or equipment, in a confined area which affords inadequate protection against atomic effects. The elements of timing and surprise will be of critical importance in attacking them.

Targets for interdiction.—These may be topographical features, not necessarily occupied by the enemy, which if neutralized by atomic attack would delay or prevent enemy operations or compel him to concentrate elsewhere.

Since, by nature, such targets will be places where the enemy is expected to go, the assessment of their importance by the intelligence staff will need to be remarkably quick and bold to be of use.

The calculated degree of effect which destruction or interdiction of a target will have on the immediate battle will determine its priority for tactical atomic attack.

This will be the overriding consideration.

By applying these definitions and principles to any given situation, it should be possible to decide what targets are suitable for tactical atomic attack, and in what priority, in order to give optimum support to the over-all tactical plan.

Examples of "destruction" and "interdiction" targets suitable for tactical atomic attack, likely to occur in a future war on land are shown on page 107. Many other possibilities suggest themselves, especially if the reader takes an existing plan for a particular sector and studies the operational maps entirely for the purpose of selecting tactical atomic targets. It will be found that the defense of a major obstacle, and the counterattack, are the two phases of war which offer the most fruitful field for further study.

Three overriding factors dominate this problem; secrecy, speed, and safety.

Secrecy; to ensure that the atomic at-

tack achieves surprise, for there is no need to depict the haste with which an enemy would disperse from a target which he expected to be attacked with an atomic missile.

Speed; because the preparations and precautions necessary before an atomic missile could be fired are considerable and will take time. Speed again, because targets suitable for atomic attack may be fleeting in mobile operations and such opportunities must be seized when they occur.

Safety; because no one will want to risk dropping an atomic missile on an enemy target if there is a danger of killing numbers of our own troops. An exception to this might be made where we enjoyed deep-dug protection with overhead cover while the enemy attacking us did not.

The demands of these factors are conflicting. Safety precautions require the fullest spread of information and warning of impending atomic attack to all friendly troops in the target vicinity and to those who may have to follow up the attack, over the target.

However, the fewer people who have to be told, the easier it is to preserve secrecy. Codes make for security but not for speed. Therefore a compromise is inevitable; but in this case it *must not prejudice surprise*. A suggested procedure for demanding tactical atomic support designed to meet these conflicting requirements is as follows:

1. A tactical atomic support demand proforma, on the lines of an air support demand, giving all necessary data of target, time of attack, type of burst and effect desired, position of our troops, and other special safety factors. This proforma should be brief, unmistakable, and suitable for encoding and transmission by telephone.

It should be held by all General and Royal Artillery staffs down to and including brigades and commanding officers of direct support field regiments, Royal Artillery.

2. Demands for tactical atomic support should be transmitted officer to officer, by secretephone, if available. If transmitted by telephone, they must be encoded. They should *never* be sent by radio, even in code,

and continuous reference between artillery commander and formation commander in approving or rejecting atomic support demands at each level, will be essential.

4. Demands for tactical atomic support

Examples of "Destruction" targets suitable for tactical atomic attack:

<i>Target</i>	<i>Aim</i>	<i>Method</i>
Concentrated hostile gun areas, such as enemy artillery grouped to support a river crossing.	Destroy guns and detachments. Reduce his covering fire.	Atom bomb or shell. Air or ground burst.
Contained enemy bridgehead on our side of water obstacle, after some build-up, but before being dug in deeply.	To eliminate it by destruction followed by immediate counterattack.	Atom shell. Air or ground burst.
Main defenses of hostile position at point of intended break-in by own mechanized or armored units.	Soften up enemy. Destroy his supporting weapons. Create chaos while we exploit.	Atom shells air burst, in succession, in depth.
Assembly areas and forming up places for large-scale enemy counterattack.	Break it up before it can be mounted.	Atom shells ground burst.

Examples of "Interdiction" targets suitable for tactical atomic attack:

Defiles, passes, and centers of communication constricted by topography.	Delay enemy in advance or withdrawal. Cut escape routes. Prevent movement.	Atom bomb ground or underground burst.
Dikes or dams, which, if breached, would flood vital areas.	Deny ground to enemy. Canalize him elsewhere.	Atom bomb suitably fuzed.

unless there are no other available means of communication.

3. Demands must follow the normal chain of command and should be sent through artillery staff channels, and *not* general staff channels.

This is an important point, because it is envisaged that the artillery commander at each level is the only person capable of co-ordinating such demands. Direct, rapid,

for future operations should be dealt with by the Army or Air Fire Support Committee, whose president is normally the senior gunner concerned with the operation.

This committee is undoubtedly the proper authority to co-ordinate the inclusion of tactical atomic support in any over-all fire-plan, whether delivered by gun or aircraft.

Decision on Priorities

As with any other type of fire support for a land battle, the commander making the plan, working with the close and continual advice of his gunner, specifies the priorities of targets to be engaged in terms of timing, duration, and weight of the available effort to be devoted to each. So with atomic missiles, the commander conducting the battle will decide priority of targets for tactical atomic attack. It will then be for his gunner and their staffs to work out details of method and issue orders for the co-ordination of all available supporting weapons including atomic missiles.

Changes in Tactics

Having discussed some detailed aspects of its tactical use in support of ground forces, let us now put the atomic missile into its proper perspective in the military armory.

Atomic attacks alone, whether strategic or tactical, will not defeat a powerful nation with a large land mass. In this respect, they are similar to the mass raids by heavy bombers of the last war. The Japanese surrender after atomic attacks on two of their cities is not evidence that the atom bomb ended World War II, because they had already been defeated decisively on land, sea, and in the air everywhere outside Japan itself before the atom bombs were used.

Without doubt the atomic missile is the most potent and destructive weapon yet produced, but in the tactical role, it is only the latest and greatest form of fire support for military operations.

It would be madness not to take full advantage of its effects to strengthen the powers of defense and counterattack by our armies, and their supporting tactical air forces. It would be madness to regard the tactical atomic missile as an omnipotent shield behind which we can reduce our conventional military forces, cut our

defense expenditure, or slacken our vigilance.

Viewed in this perspective, the tactical atomic missile must be considered as the servant and not the master of the military planner. Its use must be a means of achieving an aim and not the aim itself. At the risk of oversimplifying this point, it is stressed again that the tactical atomic missile is a *supporting* weapon.

The tactics of an army facing an opponent possessing atomic missiles will have to be changed considerably, to avoid offering an atomic target, and to force the enemy to present one.

Previous conceptions of concentration areas, assembly areas, lines of departure, and concentration of force on a narrow front, must undergo a radical change, since all entail a high density in a confined space for certain periods of time. Such density will be acceptable as a risk of war, only if it is so temporary that hostile atomic attack could not strike before it had again dispersed, or if concealment is so good that it could escape detection, or if it is moving through enemy positions which he would not subject to atomic attack.

Let none rule, however, that all forms of concentration will be prohibited in the future. Concentration of force is inevitable at some stage to win battles; but in the atomic war, concentration will have to occur from dispersed locations, at the last possible moment. The quickness with which we can concentrate and disperse tactically will become of paramount importance.

In one way, tactics will have turned full circle since World War II. Whereas, hitherto, it was good tactics to prevent the enemy from concentrating his forces for attack or defense, now it will be our first aim to compel him to do so.

Defensive tactics of the future must be subjected to the test question; will this result in our offering the enemy an

atomic target long enough for him to hit it? For aggressive tactics the test will be—how can we fool the enemy into presenting an atomic target? To answer these seemingly simple questions, a good working knowledge of the subject of this article is clearly needed.

In contrast to the radical changes in military tactics which the tactical atomic missile has forced upon us, the effect on the cardinal principles of war are different. Far from changing them, the tactical atomic missile positively reinforces the significance of some of them; notably "surprise," "security," and "economy of force."

"Maintenance of the objective" will require additional emphasis in the face of those theoreticians who claim that the atomic weapon is the end rather than the

means. And finally, "concentration" may now be given a twist to imply that it is equally part of this principle to force the enemy to concentrate—and present us with an atomic target.

Conclusion

For the first time in this century, the British and allied armies have within reach, in peacetime, a tactical support weapon which is a potential battle winner. By nature it is a weapon which will be a particularly effective killer against an aggressor who attacks with men and equipment in mass.

Let us ensure that the organization, procedure, techniques, and tactics to employ this weapon effectively, are known to all who may have to use it at short notice.

New weapons inevitably require modification of tactics and of tactical organization. The Army is carefully studying the impact of the new matériel. There is a continuous review of Tables of Organization and Equipment to make sure that they provide the optimum combination of men and matériel. Dispersion and mobility, which have always been vitally important, are receiving even more emphasis. Training in the capabilities and employment of atomic weapons is integrated into the training of officers and men at all levels. We are stressing the development of lighter and more reliable equipment and increased fire power and striking power. At the same time, greater emphasis is being placed upon the initiative of small unit leaders and the physical toughening of the soldier.

General Charles L. Bolte

BOOKS OF INTEREST TO THE MILITARY READER

CHANGING GREENLAND. By Geoffrey Williamson. 280 Pages. Library Publishers, New York. \$3.95.

BY MAJ NED A. HOLSTEN, *MPC*

This area study of modern Greenland has merited the sanction of the Government of Denmark. Mr. Williamson gives a lively account of the reorientation of the world's largest island. From a stone age reservation of 22,000 native Greenlanders, protected by the Danish Government from foreign influences, the island is being converted into an industrial society. Another link is being forged in the chain of bases for atomic age strategic warfare.

Of particular interest is the treatment of United States military installations. Especially so is the spectacular story of the creation, in the midst of a desolate arctic wasteland, of that tremendous air base at Thule. It is a veritable modern Arabian Nights story of an oasis that suddenly materialized in a desert complete with all the conveniences and accommodations of a modern twentieth century community. This "Grand Central Station" of the air lanes is uniquely situated equidistant from most of the world's capitals, a strategic position for air travel both in peace and in war.

The book is rich with stories of major events and human interest incidents that have occurred in recent years, especially during and since World War II. Equally significant is the excellent survey of the history of Greenland since her discovery around 900 A. D. by Gunnbjorn, a Norwegian explorer, until the present day.

THE PRICE OF FREEDOM. Greece in World Affairs, 1939-1953. By Dimitrios G. Kousoulas. 210 Pages. Syracuse University Press, New York. \$4.00.

BY LT COL IRVING HEYMONT, *GSC*

Situated adjacent to the Straits of Dardanelles, Greece has been the battleground and unfortunate victim of larger forces contending for control of that strategic waterway. Since the fall of the Byzantine Empire in 1453, the struggles of the Greek people had been for independence and the reunion in one political entity of all the Greek speaking peoples in the areas bordering on the Aegean seas.

Mr. Kousoulas describes with complete detail the most recent phase of Greece's troubled history. Based on an obviously detailed study and personal participation in the events he describes, Mr. Kousoulas vividly traces the latest phase of Greece's troubled history from the time of Mussolini's aggression to the failure of the Soviet Union to dominate Greece through the direct action of the ELAS, the guerrilla arm of the Greek Communist Party, the EAM.

The author does not mention the role played by the Joint United States Military Aid Group and its predecessors. It is inconceivable that a political history of Greece for the period 1939-53 should make no mention of General James A. Van Fleet and his group.

The reader who is interested in the detailed political events of the southern Balkans of the past 10 years will find this book of interest.

AN INTERNATIONAL BIBLIOGRAPHY ON ATOMIC ENERGY. Volume I. Supplement Number 2. 31 Pages. Columbia University Press, New York. \$0.30.

WORLD POWER IN THE BALANCE. By Tibor Mende. 188 Pages. The Noonday Press, Inc., New York. \$3.00.

BY COL DANIEL C. POLLOCK, *USMC*

Most of the countries of the world have never experienced responsible political power as, for example, the form of government existing in the United States. For the time being, the loss of political liberty for the great majority of mankind remains a secondary issue. For most of them economic power is of real consequence. Tibor Mende, an astute French student of world affairs, contends that the appeal of the West's ideology—under present world conditions—has very limited success among the materially needy majority of mankind. The economic security implied by communism appears of more immediate significance than freedom of speech or the right to vote.

At times the book has the conciseness and clearness of a staff study. Mr. Mende delves into the roots of present problems, analyzes the current situation, and considers the various courses of action open to the West.

The conclusions and recommendations of the author will be controversial to many, but, nevertheless, stimulating and thought provoking. The military reader who is interested in world affairs, and in the course of action that the United States must follow in the future, will find this book worth while and timely.

PRELUDE TO WORLD WAR II. By Gaetano Salvemini. 519 Pages. Doubleday & Co., New York. \$7.50.

MAGAZINE ARTICLE WRITING. By Ernest Brennecke, Jr. and Donald Lemen Clark. 486 Pages. The Macmillan Co., New York. \$4.75.

THE AMERICAN SWORD 1775-1945. By Harold L. Peterson. 274 Pages. The River House, New Hope, Pa. \$10.00.

THE STATESMAN'S YEAR-BOOK 1953. Edited by S. H. Steinberg. 1,595 Pages. St. Martin's Press, New York. \$8.00.

EIGHT BAILED OUT. By Major James M. Inks. 222 Pages. W. W. Norton & Co., Inc., New York. \$3.00.

BY MAJ JAMES N. HIGHLEY, *USAF*

This is a true story of the experiences of a bomber crew forced to bail out over Yugoslavia during the last war. It is based on the diary of the author, the navigator of the crew, and is one of the most unusual adventures ever told. A short book, it can be easily read and fully enjoyed at one sitting.

CRISIS IN THE KREMLIN. By Maurice Hindus. 319 Pages. Doubleday & Co., New York. \$3.95.

BY LT COL JEROME F. SMITH, *Armor*

Crisis in the Kremlin is an evaluation of the political maneuvers of the Soviet Government in recent years, in which the author predicts what the free world can expect from the Kremlin.

Utilizing his knowledge of the Russian people, gained through many years of traveling in the Soviet Union during and prior to World War II, Maurice Hindus has attempted to prove that the future of Soviet relations with other countries lies with the Russian peasant, and that the average Russian is tired of wars and five-year plans and wants nothing so much as continuing peace.

WRITING THE FEATURE ARTICLE. By Walter A. Steigleman. 435 Pages. The Macmillan Co., New York. \$4.50.

INTERNATIONAL RELATIONS. Basic Documents. By Elmer Plischke. 194 Pages. D. Van Nostrand Co., Inc., New York. \$2.95.

THE NEMESIS OF POWER. The German Army in Politics, 1918-1945. By John W. Wheeler-Bennett. 329 Pages. St. Martin's Press, New York. \$12.00.

BY LT COL MARSHALL H. ARMOR, JR., *Arty*

"Very early in the morning of November 10, 1918, a little group of weary and saddened men stood to attention as a special train, whose splendors of cream and gold passed unnoticed in the darkness, glided quietly from its siding at the little Belgian station of Spa and vanished toward the Dutch frontier. The two red lamps on the rear carriage signified to those few who remained behind that the last of the German emperors was passing into exile. . . . His going marked the end of an epoch both for the German Reich and for the German Army, for it left the one without a Kaiser and the other without a war lord."

Thus does John W. Wheeler-Bennett, Oxford Don, begin his story of the epoch which followed the Kaiser's going. It is the story of the rise of the German Army from the ashes of 1918 to a position of political dominance—and of military excellence—in the German Republic; it is the story of the Army's acceptance of Hitler as the new war lord, and of the Army's part in bringing him to power; it is the story of the Army's ultimate, cataclysmic collapse.

It is the story of General Wilhelm Groener, successor to Ludendorff, who formed an alliance of equality—not of subordination—between his Army and the new Republic, giving his promise to preserve the Provisional Government in exchange for its promise to preserve the officer corps. It is the story of General Hans von Seeckt, who built military strength in secret for the sake of his nation and his Army, but not for the sake of the Republic. It is the story of General Kurt von Schleicher, "whose ambitions were for power rather than responsibility, for influence rather than position" and whose inept machinations cleared the way for Hitler.

It is the story of Hitler's seizure of power over the German nation and the German Army, and of his subjugation and humiliation of the officer corps. It is the story, in illuminating and unprecedented detail, of the ill-fated *putsch* of 20 July 1944.

It is a story artfully told, in an atmosphere of suspense and intrigue, but with consummate scholarship and careful documentation. It is the crowning achievement of Wheeler-Bennett's lifetime of study and is, it has been said, "probably the most important single historical work on modern Germany."

Its reading is a must for the professional officer, although some will not agree with all of the author's conclusions, nor even with all of his evidence. Some will say, for example, that Ludendorff's dictatorship was far less absolute than Wheeler-Bennett avers in a brief flashback. Some readers of the German generals' postwar apologia will question also his unequivocal statement: "The Allied formula of 'Unconditional Surrender' played no part in the hesitancy of the German generals to remove Hitler."

Some will think it unlikely, too, that the German generals were restrained for reasons quite so simple as those Wheeler-Bennett gives. "The majority were out to make their professional and social careers in the most material sense," he says. "Marshals' batons and knights' crosses, gifts, estates, and building permits silenced such pangs of conscience as may, from time to time, have assailed them. They were not disposed to overthrow their Führer while he still had these honors within his gift."

Admonitions must be but mild, however. *The Nemesis of Power* is a monumental work, a book to be read and studied; a book for reference. It is also a book of history which poses a question for the future.

The author asks, "Is there a new spirit abroad in Germany, or is this merely 'where we came in' in the repetitive history of the German Army in politics?"